

Process and Pattern of a Curriculum Innovation

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Abstract

This research focuses on the complex processes of inertia and change achieved through a case study approach. The innovation in question is the use made by secondary school geography departments of computer assisted learning. This longitudinal study (between 1983 and 1989) studies a selection of schools in two local education authorities. Particular emphasis is placed on the enabling and constraining roles of a range of 'actors' and 'environments'. 'Actors' include geography teachers, heads of department, advisers and heads. 'Environments' include departments, schools, local education authorities and Microelectronics Education Programme (MEP) regions.

The structure of the thesis is as follows: The researcher's personal interests and involvement in curriculum development and IT and geography education are outlined; the literature on innovation, change and IT and geography education is reviewed; this is followed by the focus and related research design; the wider context of the nineteen eighties is portrayed both as 'educational' and 'IT' environments before the core and peripheral data is analysed via 'portraits' and 'themes'; existing theoretical models are applied to the data and then new models are developed to help describe and explain the data; the research is concluded by pointing out its limitations, making some personal (the author's) observations and suggesting opportunities for further research.

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Chapter One

Introduction

My research 'story' involves the juxtaposition of two professional interests. The one, pervasive and long-standing throughout my career, has been curriculum development and the other, more transitory, but still spanning the decade of the nineteen eighties was the use of computers in the geography curriculum.

I first became interested, involved and aware of curriculum development in geography, albeit in the sense of content, when as an undergraduate at Cambridge between 1964-67 I was fortunate to experience the beginning of the spatial and scientific period in UK geography. The ferment this engendered had begun to occur in the USA ten years earlier but it was Haggett, Chorley and to a lesser extent, Stoddart, who were the proponents in the UK of this 'new geography'. I was a first year undergraduate when Haggett's "bombshell" hit the world of academe (Haggett, 1965), and was just about to graduate when *Models in Geography* (Chorley and Haggett, 1967) was published. I was made aware very directly that various traditions (paradigms) were in direct conflict and my own conceptions of the subject were in a period of flux. Undertaking graduate work at the University of Wisconsin, Madison 1967-68, again at first hand, I could observe the 'young turks' of US geography (eg R H T Smith and W A V Clarke) engaged in what at times seemed to be a power struggle over the subject with the likes of R Hartshorne and G Trewartha. This struggle fascinated me and my sympathies were very much with the new generation.

Having decided to teach, I undertook a PGCE course at the Institute of Education where for the first time I became aware that at school level, geography was not only shifting paradigms but that exciting pedagogic changes were afoot. N J Graves and M C Naish of the Institute of Education, who were among the 'young turks' of the age in geography education, had quite different perspectives to M Long and B Roberson, their tutor colleagues. I found the 'struggle' fascinating and I became actively engaged in the new geography on my teaching practice, where the then head of department was B FitzGerald, and N Grenyer was one of the staff. The frisson of excitement generated by workshops led by FitzGerald and R Walford at Maria Grey College was not lost on me! The feeling that one was involved in a mildly subversive set of developments was very seductive.

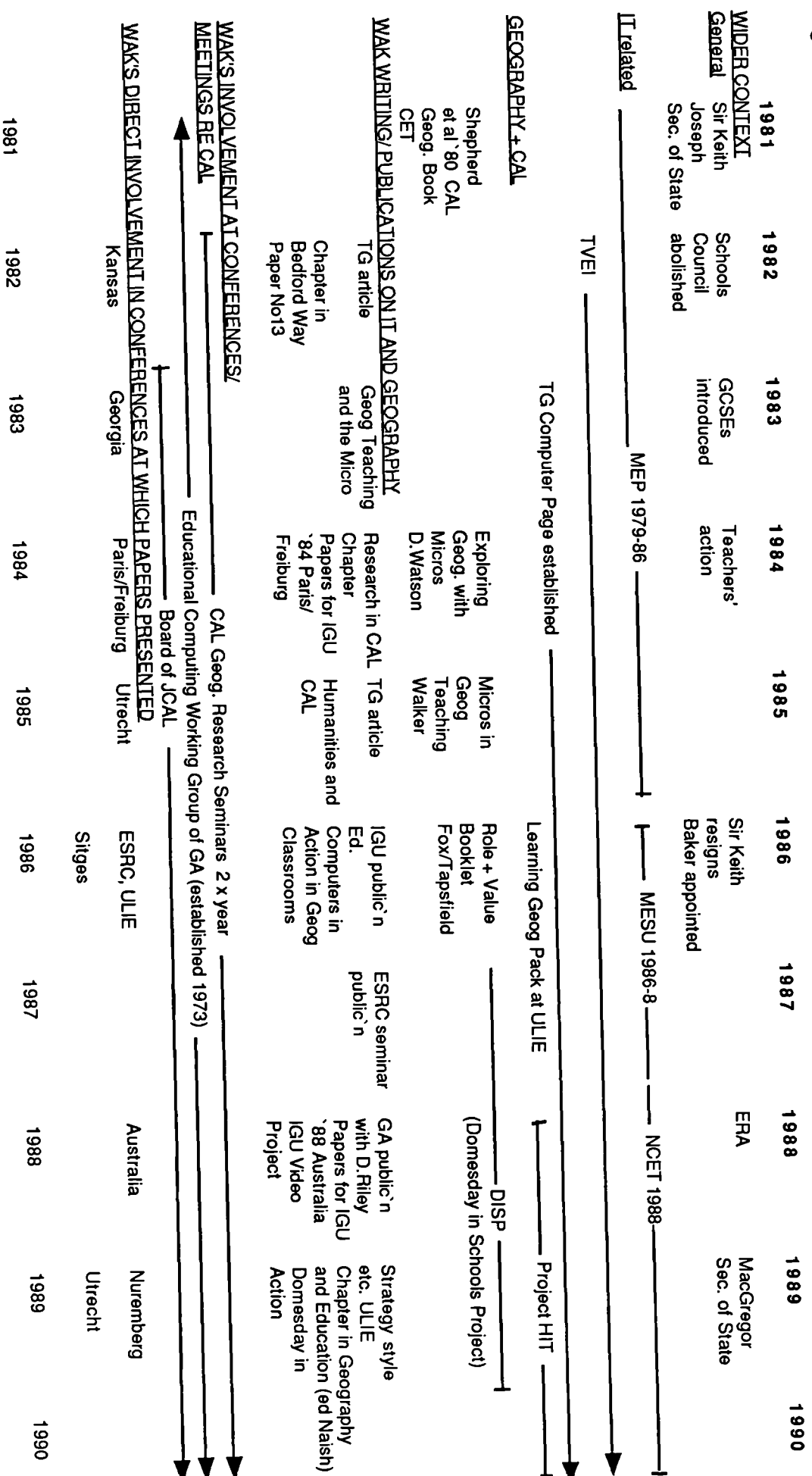
My next stroke of fortune was to gain a teaching appointment at Haberdashers' Aske's School, Elstree where under the able leadership of J Rolfe was assembled a young and enthusiastic department. They included C Rowe, R Dearden and N Grenyer. Most significant in my time there was the writing of the Oxford Geography Project for Years 7-9 and our involvement as a pilot school for the Geography 14-18 (Bristol) Project. Being at that school at the time was a considerable privilege since there was an indefinable yet favourable 'climate for change'. So much so that the biology and history departments as well as the geography department wrote several popular textbook series. R. Walker, now an eminent education professor, was engaged in research work at the school attempting to tease out the circumstances that led to its highly innovative environment for curriculum development. His results remain unpublished since staff (present and former) were unhappy about him publishing the results!

I then had the opportunity to run the geography department at John Mason School Abingdon, where the head, K Dawson, was highly supportive of my changing the entire geography curriculum. Ably supported by E Rawling, we were able to re-write the Year 7-9 curriculum, become a pilot school for the 14-18 Project, develop a fieldwork programme across the years and change the 'A' level course.

Up to that point, I had been actively engaged in curriculum development as a teacher in schools. Becoming a team member of the Geography 16-19 Project meant that I took a different perspective on curriculum development. Now I had, through my colleagues M C Naish and E M Rawling, and teachers' groups, become involved and interested in the management and planning of change in institutions other than my own. Subsequently, as a member of the geography team at the Institute of Education, London, curriculum development has been a central professional concern through the PGCE and MA courses as well as through INSET courses. During the nineteen-eighties for instance, I ran courses on Recent Developments in University Geography (1980 and 1984), *Space, Place and Region* (1985) and *Embassies as a Teaching Resource* (1983) as well as a number of computer related courses.

I have engaged in curriculum development in two distinct ways. Firstly in my career as student and teacher in secondary schools, wrestling with its challenges. Then, as an academic in a university school of education, where I have been trying to understand it through reading and research, and have been involved in encouraging schoolteacher colleagues to engage in it, in one way

Fig. 1.1 THE 1980s - THE AUTHOR'S (WAK) AND THE WIDER ENVIRONMENTS



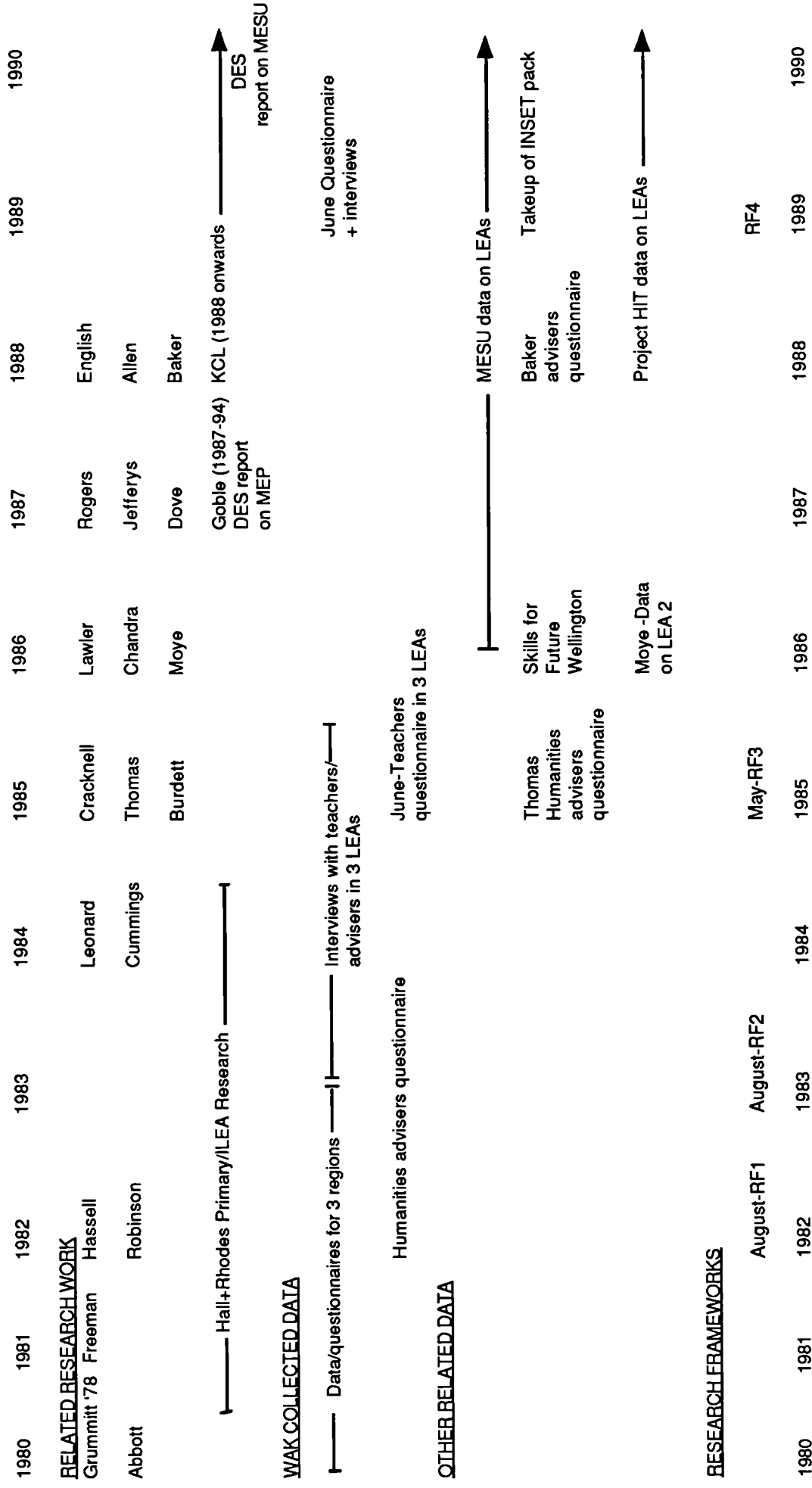
or another. As this brief professional history suggests, I have been particularly fortunate in working in institutions where change was encouraged; working with immediate colleagues of great talent; and working in teams like minded in their commitment to curriculum change. As a result I see change and development as the norm and therefore find particularly challenging, circumstances where change is constrained and not built into the school or department structure and the psyche of fellow professional geography teachers.

Since 1979 I had been looking for a research focus which would incorporate this longstanding interest in the circumstances that do and do not lead to curriculum change. A seminal moment occurred in the summer term of 1980 when Deryn Watson from the Computers in the Curriculum Project based at Chelsea College, ran a session on our MA Geography in Education course. The session was on computer assisted learning (CAL) in geography and she outlined the new and enormous potential of microcomputers for education. Although I had been involved a little in CAL geography before this, through the geography committee of the Advisory Unit for Computer Based Education and through helping to develop some 16-19 programs, I had remained interested but sceptical of CAL's likely impact. The realisation, through Deryn, of the potential curriculum impact of CAL because of the emergence of micros with their power and relatively small cost, was a defining moment. It led to a decade of studying and researching CAL geography but in particular, as far as this research is concerned, it led to the first research framework being devised. This was at the interface between my longstanding curriculum development interests and my incipient interests in CAL geography. The evolution of this research and my own involvement and wider circumstances over the nineteen eighties can be shown diagrammatically (Figures 1.1 and 1.2).

Figure 1.1 shows the nineteen-eighties in terms of CAL geography developments and my own engagement in such developments. The detailed educational, IT and IT geography contexts of the nineteen eighties are portrayed in chapter four.

The decade of the nineteen eighties was one of change and, as it culminated with the Education Reform Act of 1988, of teacher unrest. The world of information technology was overseen at a national level by the distinctive thrusts and policies of the Microelectronics Education Programme (MEP), the Microelectronics in Education Support Unit (MESU) and the National Council for Educational Technology (NCET). Most significant for geography education was the publication by Shepherd et al (1980) of their seminal text; the establishment

Fig. 1.2 THE 1980s - THE IT GEOGRAPHY RESEARCH ENVIRONMENT



of the "Computer Page" in Teaching Geography in 1983; and the key role of the Educational Computing Working Group of the Geographical Association set up in 1973. I was a member of this group from 1981 onwards.

My interest in researching CAL geography began with my collaboration with D. Hall and P. Wiegand culminating in two articles for Teaching Geography (Hall et al. 1982 and 1985). Although I was involved with curriculum development related to CAL geography for instance with a series of classroom case studies published by the Geographical Association (Kent, 1986a); Project HIT (Humanities and Information Technology Project); Learning Geography with Computers Pack; Domesday in Schools Project; and production of some 'A' level oriented programs under the auspices of the Computers in the Curriculum Project, my major professional interest in CAL geography through the nineteen eighties was research focused (Figure 1.2).

Most importantly I was fortunate to supervise a succession of MA students in their CAL related research work and convened twice yearly CAL geography research seminars at the Institute of Education, London. These, alongside attendance and presentations at a number of international research oriented conferences, fuelled this interest and engagement. At the same time I was invited onto the Board of the Journal of Computer Assisted Learning in 1983 and between 1982 and 1992 I taught an optional course on the Institute of Education PGCE course on CAL for teachers of business studies, economics, history and geography.

This combination of interest and involvement in curriculum development and CAL, led through the nineteen eighties to this PhD research and its evolving research framework, and the consequent ongoing collection of data (see Figure 1.2). How this research developed is the subject of the next chapter.

Chapter 2

Literature Review

Evolution of IT and Geography Education

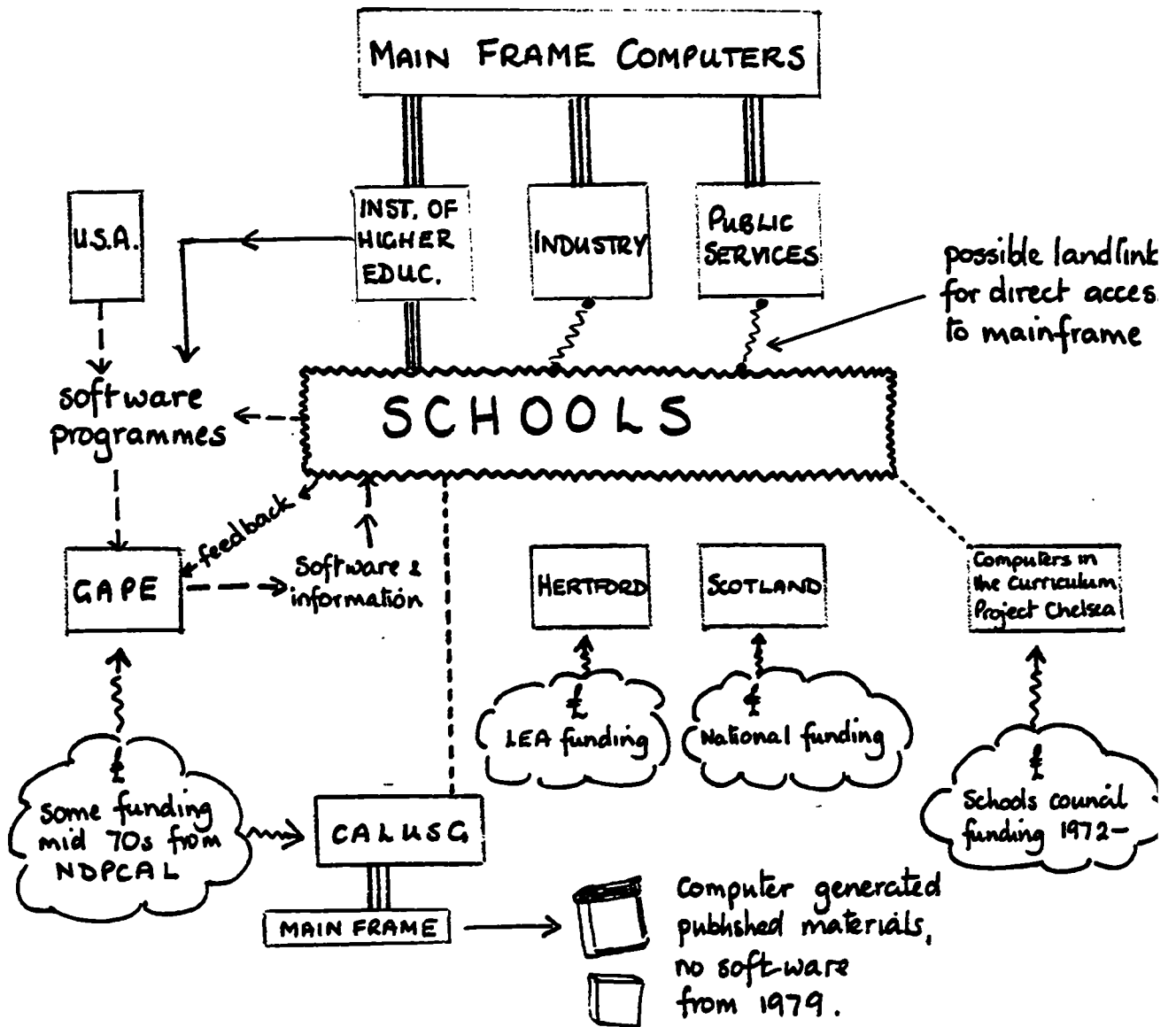
The decade of the nineteen eighties was a period of great development in the incorporation of IT into the curriculum. The wider IT environment of the decade is portrayed in chapter 4 but here I intend to reflect on the specific developments involving IT and the teaching of geography. The changes and developments have been well documented in the literature. I have contributed to this by writing or co-authoring a number of pieces which describe, I trust not uncritically, these developments.

In 1982 I wrote with David Hall and Patrick Wiegand an article reviewing the state of play, partly based on a questionnaire survey of teachers carried out in 1981 (Hall et al, 1982). This was followed in 1985, again in *Teaching Geography* and by the same authors, by another article this time partly based upon the results of another questionnaire survey completed in 1983 (Hall et al, 1985). I also wrote several items in 1984 (Kent, 1984 a, 1984b, 1984c, 1984d) and 1985, (Kent 1985a, Kent 1985b). More complete portrayals were written in 1982 (Kent, 1982 new edition 1985), 1986 (Kent, 1986b) and 1992 (Kent, 1992).

David Hall, Patrick Wiegand and I used Mumford's well known classification (Mumford, 1938) as the basis for a three era classification of computer assisted learning (Hall et al, 1982). The 'paleotechnic' era (1970 -79) shown in figure 2.1 was a time when the majority of teachers were untouched by computers in spite of the activities of the Geographical Association Package Exchange (GAPE), Computer Assisted Learning in Upper School Geography (CALUSG) and the Computers in the Curriculum Project. This was the age of the mainframe computer. As we described it in 1982, 'There are no formal links between the centres, although common sense reminds one that the activists were well aware of the other elements and exchanged information, ideas and experience informally. Contact with schools was either fragmented or on a well-defined territorial basis. The target audience was ill defined, and in-service facilities were nationally insignificant outside Scotland', Hall et al (1982, p.136).

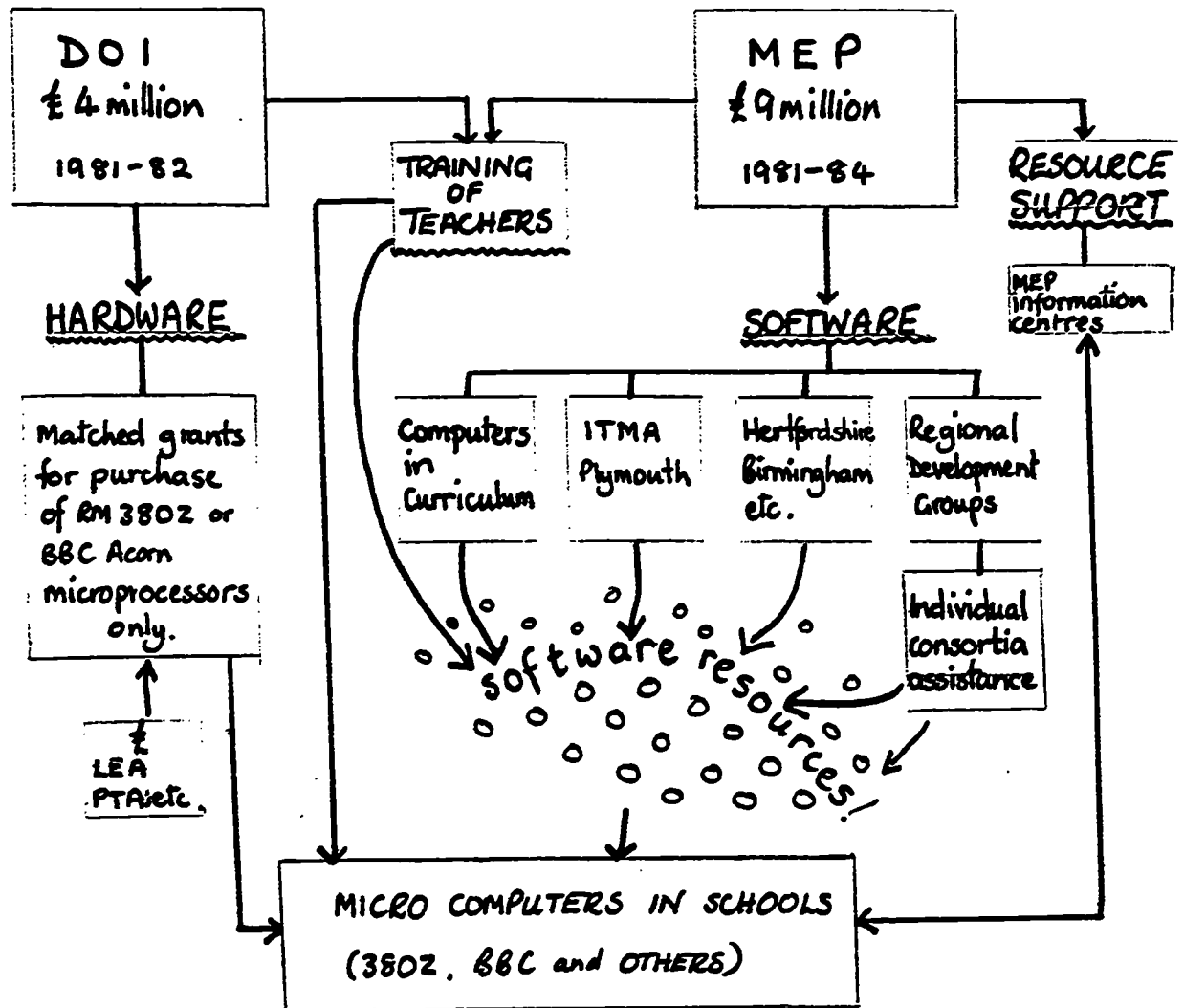
The 'neotechnic' era (1979-84) as illustrated in figure 2.2 began with the arrival of the microcomputer in schools via a government subsidy scheme (see

Fig 2.1 The Paleotechnic Era of Computer-Assisted Learning: 1970-1979



G.A.P.E. Geographical Association Package Exchange.
N.D.P.C.A.L. National Development Programme in Computer Assisted Learning.
C.A.L.U.S.G. Computer Assisted Learning in Upper School Geography.
L.E.A. Local Education Authority.

Fig 2.2 The Neotechnic Era of Computer-Assisted Learning: 1979-1984



- D.O.I. Department of Industry.
M.E.P. Microelectronics Education Programme.
I.T.M.A. Investigation on Teaching with Microcomputers as an Aid.
L.E.A. Local Education Authority
P.T.A. Parent-Teacher Association.

chapter 4) and the establishment of the Microelectronics Education Programme (MEP). The increased availability of computers, organised in-service training of teachers and production of software led to a rush of activity in some geography classrooms. But as we said in 1982, 'Few geography teachers have as yet used computers to assist pupil learning, although we sense the 'pre-conditions for take off' as both hardware and software become available in school', Hall et al (1982 p.138).

Arguably the 'aeotechnic' era arrived in 1986 with the establishment of the MESU (Microelectronic Education Support Unit) which, as will be seen later in this chapter, was of particular help to geography teachers.

Software developments were rapid during the nineteen eighties particularly through the investment by MEP in software producing agencies such as the Computers in the Curriculum Project, Investigations on Teaching with Microcomputers as an Aid (ITMA) and the Advisory Unit for Computer Based Education. Most software was subject specific but by the later nineteen eighties general purpose (non-subject specific, content free, horizontal and generic) software began to appear. Longman made a major commitment to software by creating a separate arm 'Longman Micro Software' as did Nelson through its NELCAL development. Figure 2.3 shows the involvement of other publishers and the particularly rapid publication of software in the early nineteen eighties. As the diagram indicates, geography had benefited from some relatively early subject specific software in the form of the first GAPE and Computers in the Curriculum Project programs. I wrote about the process of software development in 1984,

"As might have been expected, the way software has been developed across Britain has varied enormously. In Scotland most software produced has been public domain and so reached the schools quickly. Soon in England however, software production and supply became private/commercial domain and the honeymoon period of freely copying and exchanging programs soon ended. Various agencies have emerged as software publishers (fig. 2.3).

Individual schools such as Sevenoaks produced programs for in-school and at most local consumption whereas other schools made early links with book publishers interested in moving into software publishing. King Edward VI Fiveways School began developing programs for the Heinemann Computers in Education Company and Netherhall School

Fig 2.3 Development of CAL Geography Software in the Early 1980s

Pre	1979	GAPE (eg HURKLE, CHAGGA, WEBER, SPITSYM)
	1979	CICP Longman (eg FARM, MILL, DEMOG)
	1982	FIVEWAYS Heinemann (WEATHER, CLIMATE)
		ITMA Longman (PIRATES)
		ABERDEEN COLLEGE (SETTLEMENT UNIT)
		NEWHAM COLLEGE (Phase 1 eg CATTLE; Phase 2 eg PERU; Phase 3 eg DIFFER)
		NETHERHALL Cambridge. (MAP SKILLS 1; MAP SKILLS 2)
	1983	CICP . Longman (eg GROWTH, WELF, RICE, HILLS, MATHUS, WINDS)
		FIVEWAYS Heinemann (CONTOUR, MAPPING SKILLS)
		HATFIELD Longman (Pack 1 eg HIKE, RAIL; Pack 2 eg LOCATE, HUFF)
		GINN (ADVENTURE ISLAND)
		QMAP (QUEST)
		BP (SLICK, PARAFFIN FILE)
		GEO (eg SPLASH)
		MJP (FIELD STUDY TECHNIQUES. MAGMA)
		SEVENOAKS SCHOOL (OIL, CLOUDS).
	1984	GAPE/MIDGLEY Hutchinson (eg COAST, DROPLET, IRRIGATE, SLOPE)
		NEWHAM COLLEGE Nelson (TOURISM, CITIES)
		DUDLEY Heinemann (eg DAIRY FARMING, TOWN PLANNER).
		ARNOLD WHEATON (WEATHER STATION)
		ITMA Longman (TRANSPOTS)
		RAMSAY Longman (WEATHER FORECASTING)
		LONGMAN Longman (FACTORY LOCATION)
		ILEA (eg BAR CHARTS, HYDROGRAPHS).
		BBC (eg TRAFFIC ANALYSIS, DRAINAGE BASIN).
Expected		FERGUSON/BATH (GEOBASE)
Soon		NELCAL (eg PATTERNS OF UNDER DEVELOPMENT, CENSUS DATABASE).
		St MARTINS/BRATHAY (eg CONFLICT, HISTO, SALT)

Cambridge for Cambridge Micro Software a branch of Cambridge University Press. Some colleges of education began to produce programs for their own students' use and the Liverpool Institute of Higher Education is a good example of this. Other colleges such as Newman College, Birmingham linked up with a book publisher, in this case Nelson, to market their products whilst others such as Aberdeen College of Education published programs in their own right.

The major source of programs however has been the book publishers who have established their own companies. By far the most committed and prolific producers have been Longman (Longman Micro Software) and Heinemann (Heinemann Computers in Education Company). Other publishers have also engaged in software publishing but rather later and not at the same scale. Examples include Nelson (NELCAL) and Cambridge University Press (Cambridge Micro Software) as well as Ginn and Hutchinson. The majority of textbook publishers however are showing cautious interest and are watching carefully the experience of Longman and Heinemann without committing themselves.

Certain LEA's at an early stage began to be involved in software production, such as Hertfordshire. Furthermore ILEA in the last two years has become very active in software development and evaluation. The final source of software has been specialist software houses, usually small scale operations such as Avon Margetts Computing.

Each of these software agencies has adopted different program styles, pricing, packaging, and organisation. Longman for instance, has established a separate section of the company based within the Longman Resources Unit at York and has appointed a publishing manager who deals with any problems arising. The format of the documentation is standardised as A4 size booklets and each package held within firm covers consists of a cassette or disc, a running sheet to enable a program copy to be made, students leaflets and a teachers guide. Heinemann on the other hand for its Fiveways Software has a much smaller 6" x 8" format, again between hard covers containing just the disc or cassette and a set of teaching notes. They too run a query service. Perhaps the most significant difference between programs is the style of the original developer. So, for instance a Computers in the Curriculum Project program will demonstrate a quite different philosophy to an ITMA, GAPE, or Hatfield program. Hence, so far,

there is no obvious norm for program development since it is at such an early level of sophistication. On the other hand the themes and topics of some programs rather overlap. This is true of several data handling, hydrology and map skills programs.

Although the earliest pack of seven programs (now published by Longman and originally selling for under £20 in 1979) has proved popular along with the two packs of Hatfield programs (Hatfield Pack 1 and Pack 2) the general trend has been to publish single programs. At present these vary in price from £15 to £30, dependent on the sophistication of the program and when it was published. Every indication is that software prices will rise sharply. A major reason for this is that at present much software has been produced via considerable hidden subsidies from MEP. When these subsidies largely disappear, in 1986, then market rates will have to be charged. There is little doubt that MEP support has encouraged publishers into the market place. For instance Jane Richardson's St. Martins/Brathay fieldwork programs; Iain Ferguson's Geobase developments at Bath; and Diana Freeman's work 1984-86 on data handling have all been paid for by MEP and no doubt their finished forms will be taken on by publishers. Even so, there is little evidence to suggest that large profits are being made by subject specific programs. On the other hand non-subject specific programs such as data handling and primary oriented programs have sold in large numbers. This author assumes that the early adventurous publishers are involved in order to gain a reputation in this field and to eventually make longer term profits. There is no evidence of financial gains being made at present.

Other early common characteristics have been considerable delays in the publication of long promised programs, not least in the conversion of 380Z versions to the now necessary BBC versions. Indeed experience has shown that early programs were not user friendly, contained many errors, often just did not run or load and failed to make use of colour or high resolution graphics. This points to a major weakness in the present process of software production, namely evaluation. As in the business and commercial world, educational software has been inadequately researched into and evaluated. The pressures on development have been considerable and this has led to an indecent haste to produce. It is a rare program which has been thoroughly tested in the classroom and accordingly altered.

On the other hand more thorough research has been organised (see later in this chapter) and software reviewing through Teaching Geography, Educational Computing, local teachers groups and MEP regional information centre newsheets has increased. A good sign is the imminent arrival of a new journal of educational computing (This was to be the Journal of Computer Assisted Learning) . It is also fair to comment that published programs are more sophisticated and depend on colour, high resolution graphics and disc drives. This reflects the growing band of individuals often working in teams developing the necessary skills of the educator, programmer, illustrator and publisher. The publishing industry has also rapidly noticed and adjusted to the greater numbers of BBC micros in secondary schools as well as the considerable primary school/home computer overlap with Spectrum and BBC micros. The DUDLEY programs are one publishers attempt to span primary, secondary and home computing as well as cutting across subject boundaries. The potentially massive markets for programs in the primary sector and at home have led to an explosion of numeracy and literacy programs. Geography programs hold relatively little attraction to publishers in comparison.

Finally, most geography programs which have been produced can be fitted into one of three broad categories. These are data handling (e.g. QUEST); simulations of models and systems (e.g. WATER ON THE LAND) as well as decision making exercises (e.g. ROUTE) and games (e.g. RICE); and skill reinforcement programs (e.g. MAP SKILLS)", (Kent, 1984d).

Undoubtedly the major agency for subject specific software development was the Computers in the Curriculum Project. Deryn Watson, a leading member of the project, and significantly a geographer, wrote up the project's unique process of producing software in her own book (Watson, 1987).

A particularly important source of support for geography teachers interested in CAL in the nineteen eighties (and for that matter the nineteen seventies) was the Geographical Association(GA). The Computer Working Party of the GA was established as early as 1973 'to collect and publish information on computer assisted learning in geography and to organise seminars and workshop sessions at annual conferences of the Association', (GAPE pamphlet, no date). This group became the Educational Working Group of the GA of

which I was a member between 1981 and 1989. Later it became the Information Technology Working Group of the GA. It still exists under that name. Equally important was the establishment of GAPE (Geographical Association Package Exchange) set up in 1976/7 through financial support from NDPCAL (National Development Programme in Computer Assisted Learning). As a result it became a computer package publishing service, a source of advice and information particularly through its termly newsletter, (GAPEVINE) and organisation of in-service training. My records show that by 1981 GAPE distributed 13 'packages' as they were then called, including CHAGGA, CORR, GRAVITY, SPITSIM, RAIL and WEBER.

By April 1983 the *Teaching Geography* Computer Page had replaced GAPEVINE and GAPE now stood for Geographical Association Package Evaluation. Rather than producing software it took on the role of evaluating software and in its first two years it evaluated CLIMATE, WEBER, CHAGGA, HURKLE, GEOFILE PROGRAMS, INTRODUCING MAP SKILLS 1 and 2, WEATHER, GEOBASE, CONTOURS and RICE.

In time the *Teaching Geography* Computer Page became a forum for new developments in computer assisted learning as well as its original function of software evaluation. The GA published a range of materials which supported geography teachers, none of which was as influential as the book by Shepherd, Cooper and Walker (1980) which was very advanced for its time. Other publications included Fox's *List of Geography Software*, (1980); Fox and Tapsfield's work on *The Role and Value of the New Technology in Geography*, (1986); a Teaching Geography Special co-ordinated by Kent in 1986; and *New Technology in Geography - Some Practical Suggestions* by Kent and Riley in 1988.

Another important support for CAL geography was the MESU (Microelectronics Education Support Unit) which existed between 1986 and 1988 before being subsumed along with the Council for Educational Technology as the National Council for Educational Technology. In spite of its short life it achieved a great deal under the dynamic leadership of Andrea Tapsfield who was responsible for the humanities team. MESU's particular strength was in training the trainers, specifically local authority advisers and teacher trainers. Arguably the biggest encouragement at the time, for geography teachers to incorporate IT in their curricula, was the 1988 publication by MESU of the *Learning Geography with Computers INSET Pack*. Its outline (fig 2.4) illustrates its richness as an in-service and initial training resource for geography. It was compiled at the

Figure 2.4 The Learning Geography with Computers INSET Pack

What is included?

The eight modules contain:

- a guide to using the pack
- case studies illustrating the use of software in classrooms
- examples of classrooms and INSET activities
- advice on using computers in the geography curriculum
- articles on the role of information technology
- checklists to help you organise and evaluate the use of computers
- classroom materials, including commercial software

What are the modules?

- Starting Out ... Learning Geography with Computers
- Using ... Learning Geography with Computers
- Development Studies
- Economic Understanding
- Physical Processes
- Population and Settlement
- Reading About ... Learning Geography with Computers
- Materials For ... Learning Geography with Computers

Data handling, oracy, fieldwork, and other cross-curricular themes are covered across the modules.

What Software?

- | | |
|---|------------------------------|
| • CHOOSING SITES | Longman |
| • CLIMATE GRAPH | Andrea Tapsfield |
| • FRONT PAGE EXTRA | Micros and Primary Education |
| • GRASS | Newman Software |
| • HUMAN POPULATION GROWTH | Longman |
| • SAND HARVEST (BBC only) | CWDE (Longman) |
| • SLOPES (BBC only) | Granada |
| • DRAINAGE BASIN SIMULATION
(RML only) | ILECC |
| • STARS | Advisory Unit, Hatfield |

Also data files on weather, population, development, occupations, census.

What computers will be needed?

Learning Geography with Computers will be available in two versions:

BBC for BBC B and Master computers

Research Machines for 480Z and Nimbus computers
(NB: some software may not be available for all machines)

Who has the pack been written for?

- teachers
- teacher educators
- INSET providers
- advisers and advisory teachers

For use with school based GRIST, 'Baker' days, PGCE courses, INSET courses, curriculum diplomas and certificates or as a self-study pack.

(NB: This was a publicity sheet about the pack)

Institute of Education, London between 1986/7 and was edited by Deryn Watson. A network of university department of education tutors was set up by MESU to provide regional co-ordinators for subsequent inservice based on the pack. Alongside the pack, MESU produced a video of *Classroom Case Studies* again published in 1988. Other support materials published by MESU were *Using Computers in Fieldwork* (1988); *Using Weather Satellites in Schools*; and *Domesday Ideas* (1988).

Arguably as significant as the *Learning Geography with Computers Pack* was Project HIT (Humanities and Information Technology) established in 1988 by MESU for two years in the first instance. Again based at the London Institute of Education, it aimed to support teachers' groups in history, humanities and geography who wished to explore ways in which IT could be effectively used. These groups (11 in 1988/89) produced materials in the form of modules or units to integrate IT into their curricula. Some of these history and geography units were subsequently published by Longman.

There were various other publications aimed at geography teachers published through the nineteen eighties. These included *Geography Teaching and the Micro*, (Kent 1983) based on a conference held in 1982; *Exploring Geography with Microcomputers*, (Watson, 1984); *Microcomputers in Geography Teaching*, (Midgeley and Walker, 1985); *Domesday in Action* (Kent et al, 1989); and *ILEA Geography Bulletin*, CAL in Geography Issue, (ILEA, 1985).

What does the literature tell us about the levels of activity in CAL geography? Some research has explored this question and is considered later in this chapter. Allen's 1988 survey suggested that popular uses of the microcomputer included: the micro as an electronic blackboard in geomorphology, weather and climate; drill and practice in map work; and statistical/quantitative work for fieldwork with a focus on geomorphology. He also discovered that wordprocessing was being increasingly used by pupils for projects and reports as well as by teachers who used them a great deal for administration and teaching materials production. Useful data comparing geography teaching and other subjects and their respective use of IT was revealed in the DES Statistical Bulletin, July 1989. Figures 2.5 and 2.6 question the common assumption that geography teachers have been more active users of IT than their colleagues from many other subjects.

One literature 'source' I was able to consult concerning IT and geography in the nineteen eighties were the minutes of the Educational Computing Working

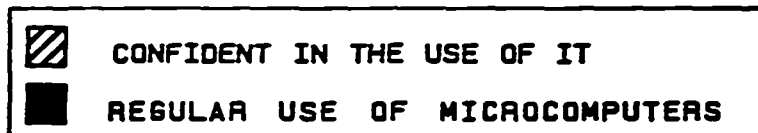
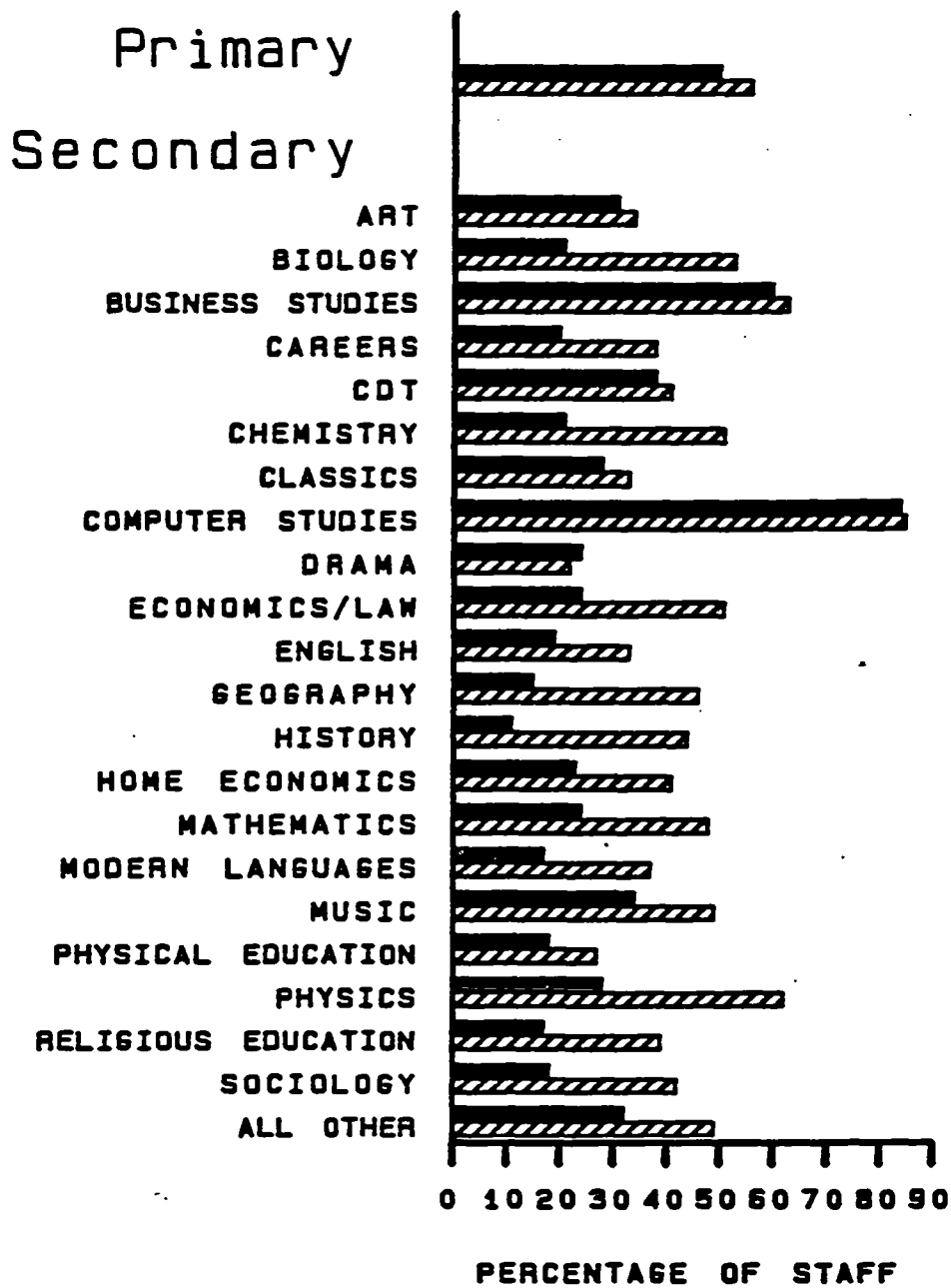
FIGURE 2.5

**PERCENTAGE OF SCHOOLS REPORTING CONTRIBUTION OF IT
TO TEACHING AND LEARNING**

	Substantial	Some	Little	None
Primary	19	67	10	4
Secondary	17	64	16	3
Art	7	37	48	8
Biology	8	28	54	10
Business Studies	64	23	12	2
Careers	14	43	38	5
CDT	18	45	31	6
Chemistry	7	43	46	4
Classics	-	25	63	13
Computer Studies	95	4	1	1
Drama	20	33	13	33
Economics/Law	11	39	49	2
English	6	38	49	6
Geography	6	35	51	7
History	5	36	50	9
Home Economics	8	40	41	11
Mathematics	6	47	42	5
Modern Languages	9	29	48	14
Music	25	36	28	11
Physical Education	13	28	28	31
Physics	7	45	41	6
Religious Studies	-	40	40	20
Sociology	-	36	64	-
All other	24	44	28	4

DES Statistical Bulletin, July 1989

Fig 2.6 USE OF IT BY STAFF



DES, Statistical Bulletin July 1989

Group of the GA. Originally established as the Computer Working Party in 1973, it was chaired by Unwin until 1982, Walker until 1984, Fox until 1987 and by Tapsfield to the end of the decade. I was a member of the Group between 1981 and 1989 and subsequently have been a corresponding member.

The minutes are an interesting reflection of the work of probably the most active CAL geography proponents. The group moved away from the original functions of GAPE in the early eighties by moving out of software production and into communication and evaluation of the worth of CAL. The minutes reveal a very busy committee acting in a highly proactive manner as new developments such as interactive video and the Domesday Project came along. Its members ran the misnamed 'Computer Page' since 1983 and produced a considerable number of books and chapters throughout the period. Some examples of these were mentioned earlier in this chapter. An important regular event was the GA Annual Conference at which the group organised workshops and lectures. Members of the group took part in a number of conferences for instance that called by the DES in January 1986 and entitled 'Geography and Computers'.

Research into IT and Education

As will be seen in Chapter 4, the decade of the nineteen eighties was a period of considerable investment by central government into IT in schools. However, in general, that cannot be said for investment in research into IT and education and specifically evaluations of that investment. As Wragg remarked in 1981, "Will anyone take the trouble to see whether the teachers are favourably disposed to it, properly trained to exploit its potential, have enough software : will anyone inquire how it is actually used or even whether the wretched machine is ever unwrapped?", (Wragg, 1981). He spoke then as President of the British Education Research Association and suggested there was a desperate need for more research to follow up policy decisions which had placed a microcomputer in every school. Similarly, at the end of the decade the TES remarked, "Despite the direct commitment of almost £50m to school computers and an unquantifiable amount indirectly through TVEI, very little has been spent on measuring its effects", (TES 17/3/89, PB21)

Underlying this huge investment in IT in schools was a largely unquestioned view on the positive impacts of children becoming more adept and used to IT. A flood of rhetoric and unreflective enthusiasm for the vocational significance of microcomputers in schools was typified by the stance of Kenneth Baker, the Minister for Information Technology in 1981 who claimed that the 'kids of today'

urgently needed modern up-to-date skills, analogous to those skills that had gained their ancestors employment (see chapter 4). The belief that future employment prospects would be greatest in IT based industry and commerce was questioned by Wellington, (1987). 'This is a belief which requires thorough and critical investigation. The links between information technology in education and information technology in employment have never been fully and critically examined. There is simply an implicit and unquestioned belief in the minds of many people (parents, children, teachers and policy-makers) that IT education at any level will make its recipients more employable. This belief has provided the main impetus for much of the information technology in schools, colleges and ITeCs (Information Technology Education Centres)', (Wellington, 1987. p. 4).

I had reflected on the 'research need' in 1987 when writing in the introduction to a book focusing on research findings and developments by remarking that, 'sadly, the research efforts underlying the exciting developments of educational computing have been limited. Ideally they should underlie the developments but usually they follow on with inadequate funding', (Kent, with Lewis, 1987). I would add now that much of this research is at MA and PhD levels and is thereby unconnected, disparate and relatively invisible.

To be fair this need for further research was recognised by the reorganised Social Science Research Council which established in May 1982 its Education and Human Development Committee. 'Early in 1983, the Committee identified and circulated for discussion an initial listing of important topics that warranted expanded support and accelerated development. The broad area of Information Technology in Education occupied a prominent place in that list. The committee emphasised its intention that research would be centred not only on the effect on education of machines to help teach the existing curriculum, but on the development and adaptation of the curriculum to equip people with intelligent machines and to prepare them for a life changed by their arrival', (Kender, 1985).

The Committee in April 1983 received the report of a consultancy by Sage and Smith (1983) which reviewed research and development activity in education being undertaken in North America. It showed that UK research was lacking in focus and was unco-ordinated. It also highlighted the lack of funds available for research and warned of the risk of dissipating research efforts through a lack of

coherence and underfunding. The conclusions of the report were that a programme of research should be initiated with a focus on two main areas:

1. the effects of the introduction of IT on the curriculum and the ways that information and knowledge are transmitted within, into and out of the education system.
2. the direct and indirect effects on pupils of learning with the aid of Information Technology.

As a result of further consultations and a two day workshop in November 1983 revised papers were collected and edited by David Smith, (1985). The Education and Human Development Committee accepted in principle the recommendations of the report. It decided against the establishment of a single new centre and instead appointed a co-ordinator to act as the focal point of the initiative. Robert Lewis, based in Lancaster, was appointed co-ordinator in 1985. At the same time Lewis became editor of the new Journal of Computer Assisted Learning which was first published in March / April 1985. In his first editorial Lewis stated ,

'The Journal aims to provide a forum for communication amongst teachers in all disciplines, teacher-training lecturers, students of education and local authority advisers. It addresses the problem of ensuring that top-level research in areas such as Artificial Intelligence, Expert Systems, Cognitive Psychology and Educational Research will influence developments and practice in education,' (Lewis, 1985. p1).

I joined the editorial board at the journal's inception and have been on it ever since. It is difficult to generalise about the research it has portrayed. Suffice it to say that much is Higher Education focused, with a short time scale and based on limited funds. Not many articles over the years have been concerned with innovation, change, constraints and the incorporation of IT in schools, in other words the focus of my research.

So what research has been undertaken into the uses of IT in education over the last two decades ? Margaret Cox (Cox, 1993) argued that there have been five categories.

1. Large scale surveys to discover the level of use of IT in schools;
2. Studies of the effects of the use of IT in particular subject areas;

3. Studies of the effects of the use of particular types of software on children's learning;
4. Studies of the effects of IT on collaborative learning;
5. Studies of classroom management of IT.

Of the first category a number of large scale surveys have been undertaken by the Department of Education and Science (DES, 1986; DES, 1989; and DES, 1992) and more recently the Department for Education (DfE, 1995). They ascertained the level of IT resource in schools, the distribution of this resource across schools and departments (in secondary schools), the frequency of use in schools and individual subject areas, and the types of software being used. However these, by their nature, tended to be uncritical and descriptive. A rather different report was produced by Wellington in 1987 summarising the work of the 'Skills for the Future' Project which set out to investigate the links between education and employment in the field of information technology. Major surveys of employers, schools, ITeCs and further education were undertaken and the final report was far from the usual bland DES document since it was intended to provide a discussion document for those in education, training and employment on the provision of education in IT and its relevance to employment.

Previous research in Cox's category two has involved many different studies of the uses of computers in different educational contexts, for example 'Multimedia Learning: the classroom experience' (Freeman, 1990) and 'Information technology and group work in physics', (Howe et al, 1991). Studies of the effects of IT on pupils' learning (categories 3 and 4) include small scale studies focusing on a single curriculum area (Spavold, 1989; Hoyles and Sutherland, 1987; and Martin and Smyth, 1987) to larger scale more quantitative studies covering a range of concept and skill learning. Over 250 larger scale studies have been reported in the literature (Niemic and Walburg, 1992) on the effects of IT on pupils' learning of particular skills and concepts.

These research findings provide substantial evidence for the positive effects of the use of IT on pupils' learning, for example that pupils develop skills in writing through the use of word processors, or develop a greater understanding of mathematical concepts through the use of LOGO. However until the ImpactT study there had not been a large scale comprehensive and longitudinal study of pupils' achievement using IT, addressing a broad range of issues across several subject and curriculum areas and levels. The ImpactT study was commissioned by the Department of Education and Science (now Department

for Education) for England and Wales as part of the Government's strategy for New Technology for Better Schools, announced in 1987. The main element of this strategy was, and continues to be, the provision of grant support for local authority expenditure on training in the use of Information Technology (IT) in schools and for the purchase of microcomputers and other IT equipment. The role of the Impact study was to evaluate the impact of IT on children's achievements in primary and secondary schools, thereby assessing the extent to which the investment had delivered the educational value added in those schools committed to IT. The project team, based at the Centre for Educational Studies (CES), King's College London, was responsible for the research design and method, data collection and analysis, and conclusions. The Impact Report was published in 1993 (Watson, 1993) and a useful summary appeared in the Journal of Computer Assisted Learning in 1994, (Johnson et al, 1994). '

The Impact study, an evaluation of pupils' achievements, teachers' practices, and schools' policies and resources, was conducted with 2300 pupils from 87 classrooms in primary and secondary schools in England and Wales. The work focused on the school subjects of mathematics, science, geography, and English, and extends the research base to include longitudinal effects within subjects, cross-subject and considerations of classroom use of IT, and the provision and use of hardware and software resources. Results from the component parts of the work were integrated to address the main theme(s). Overall indications were that in particular circumstances the use of IT had a highly positive impact on children's achievement, but this was not without substantial demands on teachers and schools,' (Johnson et al, 1994. p. 138).

The research into IT and education which relates most closely to my own focus is that which studies the uptake of computers in schools, for example Bliss, Chandra and Cox, 1988; Cox, Rhodes and Hall, 1988; Plomp and Moonen, 1992; Chandra, 1986; and Heywood, 1987. These I consider later in this chapter in the innovation and change section.

Burdett's work (1985 and 1987) is rather different from the latter but nonetheless relevant to my research. His PhD thesis (Burdett, 1985), conducted at Manchester University, was a study in the geography of education which examined the decision-making processes within state organisations that ultimately lead to variations in the level of social provision across space. He argued that the successful implementation of CAL in schools depends on the management context. He focused on the role of the LEA in

Fig 2.7**Summary of the roles of actors within the organisation**

	Authority and Outcomes			
	Case 1 No Policy	Case 2 No Policy	Case 3 Policy	Case 4 Policy
Actors				
Advisers	+	(-)	+	(-)
Assistant Education Officers	.	.	.	+
Senior Education Officers	-	(-)	+	+
Councillors	+	.	(+)	(+)
Education Chairmen	-	.	+	+
Other Departments' Officers	-	-	+	+

+ : Positive role, encouraged policy change.

- : Negative role, discouraged change.

. : No role

(-): 'in effect'

Source: Burdett (1987)

creating policies for the use of microcomputers in education in the schools for which they were responsible. He defined a policy as a 'formal statement by the Education Committee that includes a basic attempt to co-ordinate activity within the authority in terms of hardware, software and in service training, employing suitably qualified personnel, and making a commitment to provide the necessary financial resources', (Burdett, 1987. p. 30) His study analysed four contrasting LEAs and he focused on organisational processes to explain policy innovation. He argued for an organisational approach and that 'understanding organisations should be one important aim in future geographical research attempting to explain variations in outputs,' (Burdett, 1985 p. 404). He considered that a study of organisational processes at the meso level was long overdue between the relatively well studied micro level, (the study of actors especially managers in the nineteen seventies) and the macro level (the study of political economy common in the early nineteen eighties). As he remarked, 'The black box of the organisation has to be opened', (Burdett, 1985. p. 411). Although the study took predominantly an organisational stance he also considered the role of the various actors. It seemed that, 'roles furthest from the 'chalk face' had the greatest importance for educational policy innovation', (ibid, p. 394). In his case studies, advisers and education officers in departments *other* than education were both necessary and sufficient for educational policy change to occur. (See fig. 2.7). He concluded in his 1987 paper,

'If the need for a formal LEA policy is accepted as crucial to the effective development of the use of computers in education 'at the chip-face', then the differences between authorities illustrated here are significant. Given the rate of technological change and the potential growth in applications of the new technology to education it would appear that, whilst some authorities will continue to be responsive to the educational opportunities, others will fall still further behind', (Burdett, 1987, p.38).

As a part of the research Burdett undertook a national statistical analysis of education authorities and their local environments. For those LEAs that I focused on for my research (see chapter 5), I have portrayed some of the variables listed by Burdett in figure 2.8. The most significant variable as far as this study is concerned was policy innovation. As Burdett explained, 'Provision of microcomputers at school level for each authority, acting as a surrogate for LEA policy', (Burdett, 1985, p.185). In other words he made the debatable assumption that an 'indicator' of policy innovation was the extent to which microcomputers were provided for schools by LEA's.

FIGURE 2.8

CONTRASTS BETWEEN THE 3 LEAs STUDIED

(after Burdett, 1985)

Variables:

- 1 : Policy Innovation % of schools with micro in 1981.
- 2 : Size Number of councillors.
- 3 : Wealth Product of one penny rate.
- 4 : Expenditure Total net expenditure per pupil.

LEAs	Variables			
	1	2	3	4
LEA 1	84	60	485	593
LEA 2	36	66	490	495
LEA 3	30	57	57	677

Research into IT and Geography Education

Research into IT and geography education is a microcosm of research into IT and education. By that I mean that it consists of relatively small scale unconnected and disparate case study research, mainly at a masters level, supported by limited central funding and yet representing a considerable research need.

Two publications best reflect the nature and character of this research activity. The first is a chapter I wrote in 1984 in Norman Graves' book, *Research and Research Methods in Geographical Education*, (Kent, 1984c) which I have included as appendix 2.1. The second is a part of a chapter I wrote in a book summarising MA dissertations completed between 1968-1988 at the Institute of Education, University of London, (Graves et al, 1989). The title of the chapter is, 'Strategy, style, technology, bias, prejudice and stereotyping - variety and range of interest in research in geography education', (Kent, 1989). I have included pp. 87-96 as appendix 2.2.

As can be seen from appendix 2.1, I adopted a five fold categorisation of research into IT and geography education. These categories were; A: Classroom Studies; B: Evaluation of Programs; C: Resource Allocation and Management Policies; D: Curriculum Development; E: Teacher Training. Certain other pieces of research I would add to those categories. For instance I would, add Jefferys (1987) to category A. Jefferys focused on three research questions; Do students use higher level cognitive skills when involved with geography simulations and games? Does the use of CAL in geography simulations and games lead to the amplification and extension of students' thinking? Are students engaged in meaningful discussion at and away from the micro to clarify geographical ideas and concepts while decision making? The research is based upon interviews, and on lesson observations which were recorded on video. The analysis of data required the formulation of analytical categories which are illustrated in figure 5.9 (in appendix 2.2) and the outcome of the study is a set of findings which are noteworthy. First, there is wholehearted agreement with Rogers (1987) that the development of CAL requires much school focused INSET and a whole school approach, in order to change teacher attitudes and ease access to hardware. In terms of student learning, however, (and those initial research questions, above), his evidence indicated that the micro was able to minimise the low level tasks for students in the classroom and could free them to develop oral skills and problem solving

strategies, considering the consequences of their actions, drawing conclusions and making generalisations. But, it was also pointed out that, notwithstanding this positive learning taking place, teachers felt the "pressure on time" quite keenly and tended to close down on the learning experience for children. This is regrettable, though in many ways understandable; as Jeffreys recognises, CAL is seen as a major challenge by teachers who may have to develop "new skills of classroom management, even a new concept of the learning process" (Jefferys, 1987,p.190).

I would also add Goble's research (1994) to category B since it is about developing intelligent software for use by 'A' level geography students. I would add Abbott (1980) to category B, 'Evaluation of Programs' since it focused on what she called a 'practical analysis' of the learning paradigms (instructional and revelatory) used in HURKLE and the POVERTY GAME. She concluded that the 'CAL can be used to provide teaching and learning opportunities which could not be provided easily or as effectively by other means, both in the practical and educational sense',(Abbott, 1980, p.46).

Dove (1987) wrote from the context of Victoria, in Australia, and his work represents possibly the first sizeable study of the take up of CAL in that continent. He surveyed no fewer than 455 schools (the data was processed by a commercial data handling package) which represents 85% of all secondary schools in the state, and he is able to report an overwhelmingly positive attitude to CAL in terms of, for example, teachers recognising that it has a justified place in geography education. This is often because teachers acknowledge the very positive response they observe amongst pupils using the micro. And yet, he finds that the actual take up rate of CAL in teaching programmes is low. This might be as a result of perceived software problems, which Dove considered to be more acute in Australia than in the UK, but it does lead him to raise the question as to whether there is in reality an "undocumented majority of passive resistance" to the micro (Dove, 1987, p. 82).

Dove's survey was followed up by a number of interviews of teachers and it is perhaps reassuring in some ways to find that his recommendations, based upon his findings, bear close comparison to UK based research in this area. For the new technology to make an impact inside school geography departments, a whole school approach, for example, was seen as a crucial ingredient. In addition, training programmes which concentrated on the potential of the new technology for improving learning, with convincing demonstrations, were vital. Finally, the extent to which the geography department involved itself in the

decision making at various levels within the whole school was an indicator of how well the department adapted to change and new challenges; partly, one imagines because the active department would in fact be exercising a measure of control over this change. Dove's work belongs primarily to category C, 'Resource Allocation and Management Policies'.

Rogers (1987) defined his research task as an enquiry into the "constraining and enabling factors" on the take up of the CAL using Essex schools with a case study of four contrasting geography departments. His questionnaire survey enabled him to study a range of departments, which were very varied in the extent to which they incorporated CAL. The results gave us an indication of how far the process of adoption of this technology had proceeded, in terms of both hardware and the ownership of software which Rogers took to be an adequate indicator of a department's commitment to CAL.

In the schools answering the questionnaire:

The mean number of micros per school was 14;

39% had some form of networked system;

92% had a specialist computer room; and

48% of the geography staff had attended three or more courses relating to CAL.

It was also reported that:-

'45% of the schools which responded did not possess any software for the teaching of geography, and a further 30% had less than three pieces of software ... Just 11% of the sample had 10 or more pieces of software and one must come to the rather depressing conclusion that CAL is far from an established part of the geography curriculum of most secondary schools in Essex' (Rogers, 1987, p. 34)

These are disappointing findings for those who feel that the micro could be an effective stimulus and support for engaging and challenging active learning strategies. Rogers' in depth interviews, however, throw more light on to the problem than these figures merely represent, and indicate the strategies that might be adopted to circumvent them. To an extent, his findings tend to confirm what other studies have suggested in that, for example, it is usually one motivated person in a department who forms a vital catalytic ingredient in the take up of CAL, or that teachers feel a great shortage of training especially to do with teaching strategies.

Baker's (1988) research also fits within category C in appendix 2.1. and is discussed later in this section.

Figure 2.9 PANEL FOR DELPHI STUDY

The following were members of the Panel for the Delphi Study on the New Technology in Schools by 2000 A.D. (Areas of special interest within CAL are shown in parentheses:

Barry A. Benson	Software and curriculum material author. Advisory teacher with the Mobile Technology Unit at Bishop Grosseteste College, Lincoln (Remote sensing).
Alan Bilham-Boult	LEA Adviser and GCSE Examiner. Head of Freiston Hall Field Centre, Lincolnshire (Databases and statistics).
Judith A. Christian-Carter	Author and consultant. Programme Manager at the National Council for Educational Technology (IT across the curriculum; remote sensing; Prestel).
John W. Davidson	Editor of Computer Page in 'Teaching Geography'. Head of Geography at Exeter School (Enquiry learning; simulations).
John S. Davies	Head of Geography and Co-ordinator of Technology at Sutton Comprehensive School, Ellesmere Port (Writing programs for teaching and for fieldwork).
Peter S Fox	CAL Consultant and Project Director; Honorary Secretary of the Geographical Association. Careers Co-ordinator at Chilwell Comprehensive School, Nottinghamshire (Interactive video; electronic mailing).
Terry Goble	Author. Senior Lecturer in Computing at Essex Institute of Higher Education, Chelmsford (Use of content-free software, especially spreadsheets; intelligent and expert systems).
Maurice L. Hart	Committee member for DES 'Project 2000' and ex-chairman of the CNAA Computer Education Panel. Principal Lecturer in Computing at Trent Polytechnic, Nottingham (In-service training of teachers; problem solving).

David J. Hassell	Editor of 'Geography Infile' and member of several Geography/Computing working groups. Project Co-ordinator with the Advisory Unit for Microtechnology in Education (Modelling; geographic information systems and mapping).
Keith Hilton	Author and consultant on applied physical geography. Head of Geography Department at Chester College (Satellite remote sensing and image analysis).
Ashley Kent	Member of Project HIT, IGU Geographical Education Commission and the Educational Computing Working Group of the Geographical Association. Lecturer in Geography Education at the University of London, Institute of Education (Curriculum development; teaching strategies).
Geoff Nelder	Fellow of the Royal Meteorological Society. Information Technology Adviser for Humanities in Cheshire Schools and former Geography teacher (problem solving).
Gareth J. Proctor	Member of the MESU Interactive Video Trial Group and of the Cheshire Information Technology Development Consortium. In charge of Geographical Information Technology at Poynton County High School, Cheshire (Interactive video; software evaluation).
David P. Riley	Former soil surveyor and land-use planner overseas. Previously a geography teacher in further education and 6th form colleges; now a curriculum/software developer with the Educational Computing Unit of King's College London (Geographical/environmental learning activities with hypertext systems).
Ifan D. H. Shepherd	Member of the IBG Urban Study Group, the BCS Computer Graphics Group and the Editorial Board of the Journal of Geography in Higher Education. Principal Lecturer in the School of Geography and planning at Middlesex Polytechnic (Digital mapping; simulation and modelling; generic software).
John H. Snyder	Film producer for Cambridgeshire LEA. Research Director for the BBC's Sahara Interactive Video Project based in the Department of Social Anthropology, Cambridge University (Production of educational interactive video).

Andrea M. Tapsfield	Software author and Chair of the Educational Computing Working Group of the Geographical Association. Curriculum Co-ordinator (Humanities) at MESU (Human geography and IT).
Robert Taylor	Member of the Geographical Association, Head of Langley Centre for In-service and Outdoor Education, Macclesfield (interactive video).
David J. Unwin	Director of Leicester Image Processing Project and Software Centre for Geography, Joint Editor of Journal of Geography in Higher Education, and former member of the Editorial Panel of Teaching Geography. Senior Lecturer in Geography at Leicester University (Quantitative methods; climatology).
Rex A. Walford	Author, Chairman of the Council of British Geography, Honorary Vice-President of the Geographical Association and Chairman of the Education Committee of the Regional Geographical Society. Lecturer in Geography Method at Cambridge University, Department of Education (Teacher education; transport geography).
David R. Walker	Director of the Interactive Video in Schools Geography Project and Council member of the Institute of British Geographers. Senior Lecturer in Geography at Loughborough University (Computer-based simulations; interactive video; resource management).
Philip M. Webster	Member of ECWG Panel on Information Technology, and of the National IVIS and GEOBASE Projects. Head of Geography and IT Co-ordinator, Backwell School, Bristol (Databases; concept keyboards; interactive video).
Alastair J. Wells	Author; software designer and consultant. Head of Information Technology at Netherhall School, Cambridge (Databases; content-free software).
Angus K. Willson	Member of the Computers in the Curriculum Project. Director of the Channel Tunnel Curriculum Development Project, Folkestone (simulations; involvement of industry in CAL).

Source: Roderick Allen

Allen's unpublished work (1988 a and b) was partly category C and partly category D in appendix 2.1 and consisted of two major elements. The first was a survey of computer usage and views of CAL among secondary geography teachers (1988a) in South East England and East Anglia. Appendix 2.3 is a copy of his unpublished report, (Allen, 1988a). Particularly unusual is figure 3 in the report which relates computer use by type of program and topic taught. The second element of Allen's research work was a Delphi study on new technology in the teaching of secondary school geography by the year 2000, (Allen, 1988b). This unpublished report is in Appendix 2.4 and is based on the consensus views of a panel of experts looking to the future. This panel of 24 is shown in figure 2.9 and gives a flavour of the range of interest groups involved in the new technology.

Another MA level piece of research not included in Appendix 2.2 was the work of English (1988) who evaluated the potential of Prestel as a resource for geography teachers by incorporating its use into his own school's geography curriculum. This research fits clearly into category D, 'Curriculum Development', shown in Appendix 2.1.

Looking again at that five fold categorisation of research, I would now conflate these five into two broad categories since there is such an overlap between them. The original categories A and B combine to become research that concerns learning, strategies and software. Categories C, D and E I would conflate and that new grouping concerns levels of activity, teacher training, attitudes, opportunities and constraints.

The very nature of all this research, in that it is small scale and undertaken over a limited period of time, has meant a lack of co-ordination and contact between researchers. There have been two exceptions to this. Researchers at an MA level at the Institute of Education, London have been made aware of what has gone on before and thereby contact between researchers has been encouraged and overlap between them avoided. Also on a wider scale between 1982 and 1990 I organised a series of CAL geography research seminars at the Institute of Education. The first meeting was held on November 27th 1982 and figure 2.10 is a brief report of that meeting. Figure 2.11 gives an idea of the membership of the group as of November 1986. Appendix 2.5 is a compilation of reports on meetings held between 1983 and 1989. The tenth meeting due to be held on October 16th 1987 had to be cancelled, which explains why it is missing from the sequence. Looking across these 13

Fig 2.10

REPORT ON FIRST MEETING OF CAL GEOGRAPHY RESEARCH GROUP

Room 802a, 27th November 1982 at the

UNIVERSITY OF LONDON INSTITUTE OF EDUCATION

1. Apologies were received from Sue Birkill and Deryn Watson.
2. Introductions were made.
3. Formal reports were presented by Simon Grummitt, Diana Freeman, David Hassell and Catherine Robinson. Synopses of completed or ongoing research were distributed and everyone spoke briefly to their own synopsis.
4. Memberships of group was discussed. The number was felt to be about right but Andrea Tapsfield of Newman College would be invited to join us.
5. Future meetings. Two a year was felt adequate with on each occasion three presentations to allow in depth discussion and deliberation.
6. Next meeting would be on May 18th 1983 in room 802b at the London Institute at 5.00 p.m. - 7.00 p.m. The seminar would be led by Lesley Yaffe, Howard Midgley and Frank Burdett. The UDE tutors' research could be discussed if time was available.

This date could hopefully coincide with the meeting of the Geographical Association's Educational Computing Working Group's meeting since three of this group are also members of ECWG. One 380Z micro will be made available as would a VHS video machine.

7. Meeting adjourned to bar at about 8.00 p.m.

W. A. Kent

11th November 1982

Fig 2.11

MEMBERSHIP OF RESEARCH GROUP

New list amended November 1986

Ron Beard
Luton College of Higher Education
Park Square,
LUTON,
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Judith Lawler,
The Green School for Girls,
Busch Corner,
ISLEWORTH,
Middx.

Valerie Brett,
West Hatch High School,
High Road,
CHIGWELL,
Essex.

Bob Cummings,
103 Ashburnham Road,
Ham,
RICHMOND,
Surrey.

Mike Dove,
20 Henderson Street,
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David Hassell,
AUCBE
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Ashley Kent
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Paul Leonard,
93 Holmwood Road,
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Terry Goble,
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Essex.

David Hall,
University of Bristol,
School of Education,
35 Berkeley Square,
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Frank Burdett,
Bath College of Higher Education,
Newton Park,
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Paul Doherty,
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David Hall,
University of Bristol,
School of Education,
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Collingwood School,
CAMBERLEY,
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Ifan Shepherd,
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Queensway,
ENFIELD,
Middx.

Jeff Warlow,
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BRIDGWATER,
Somerset.

Deryn Watson,
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meetings there are some generalisations I can make. Firstly the numbers actively engaged in research into some aspect of CAL geography increased as the decade went on and it is noticeable that new and original research directions emerged over the eight years the group met. Furthermore much of the research was at an MA level and particularly from the Institute of Education, London. Between 1981 and 1988, for instance, 12 MA dissertations were completed on the theme of geography and IT.

Not only were these research meetings valuable for exchanging research questions and approaches but clearly the participants were keen to share the latest 'news' about the IT/geography 'world'. Finally quite a number of the research reports were about curriculum developments concerning IT and geography, for instance Project HIT (October 1988, May 1989 and May 1990) and the Learning Geography with Computers INSET Pack (May 1987).

A limited number of international efforts have been made to co-ordinate research developments in IT and geography. In August 1984 the Commission on Geographical Education invited me to engage in an international venture to ascertain the 'state of the art' in computer assisted learning across a range of countries. Contributors were asked to:- summarise recent developments; outline hardware and software trends; note the response of teachers; outline the research needs; and look to the future. Contributors were identified through the Commission Newsletter and personal correspondence. Invitations were aimed at those people known to be interested in this field. The publication was launched at the 1986 IGU Regional Conference held in Sitges, Spain in late August, (Kent, 1986c). 15 national chapters were contributed including one on England by myself.

Earlier that year another international venture took place financed by the Economic and Social Research Council. It was a research seminar on CAL in the humanities and social sciences held on April 6, 7 and 8th 1986 in London. Those invited were known to have been engaged on research into CAL and the humanities/social sciences and it was an attempt to create a springboard for more extensive research efforts. The major outcomes of the seminar included:-

- * a unique sharing of pedagogic and research concerns across subject boundaries;
- * the reality that 'research' can be defined in a broad sense from the most positivistic to the most qualitative;

- ★ the sharing of steps towards an international consensus on research issues and approaches in information technology and education in the fields of the humanities and social sciences.

In total 23 papers were presented under six themes:- Handling data; curriculum developments; teaching strategies; children learning; developing software; strategies for computer assisted learning, (Kent with Lewis, 1987).

Most pieces of CAL geography research, as explained earlier, have tended to be case studies focusing on particular themes or issues. However some research has taken a national perspective. Hall, Kent and Wiegand sent out questionnaires to heads of geography departments in the spring of 1981, 1982 and 1983. The survey involved parts of Yorkshire, London and the South West. Appendix 2.6 is an unpublished article that describes the research findings.

Thomas's (1985) work was also of national significance since his focus was on software evaluation and he questioned publishers, developers, students, teachers and advisors about their views on software. His research design is shown in figure 4.5 in appendix 2.2. Thomas concludes by listing the characteristics of 'successful' programs in the views of teachers and students and suggests ways in which program evaluation can be extended and improved.

A final piece of research with a national focus was that conducted by Baker in 1988. In the Autumn Term of 1987 Sandra Baker became one of the first three Fawcett Fellows at University College London. In her fellowship report (Baker, 1988) she explained why she wished to focus on IT during her sabbatical term.

'The quickening pace of technological development was alarming, even being able to read about it in a wealth of literature was becoming a nightmare. Also, my feeling of isolation, prevalent in many schools, departments and classrooms, was constricting the final step into the "unknown". I was aware that the pupils in my care would need to be prepared for adult life and work in a world that demands an acquisition of those skills related to the technological age in which we live. This helped me to realise that research into IT, both its implementation and implications, would need to be undertaken outside the parameters of my normal job. Especially if my doubts and lack of knowledge were to be removed.'

Her research consisted of two elements. Firstly she sent a questionnaire to all LEAs in England to the 'member of staff responsible for Geography' as she put it. She gained a 54% response rate. She concluded that, '

'the pattern emerging appears to be one of a certain amount of variety and uncertainty. There is no doubt that all Authorities have recognised the importance of IT, but progress cross curricular and in Geography, appears variable and uncertain', (Baker, 1988, p.10).

She continues,

"There is already a great diversity within the field of IT itself re - rapidly changing hardware, a confusion of software and computer language, new types of hardware available and the increase in 'jargonese', without the additional problem of variety between Authorities', (Ibid, p.11).

The second part of Baker's research was interviewing 13 heads of school geography departments from a number of LEAs in South East England. In her conclusions she was critical of the management of the innovation.

'From replies re- the introduction of IT into geography, it would appear that more guidance, support and planning is required both from the LEA and senior management within a school. Leaving such an important innovation to interested and committed individuals makes for a piecemeal attempt to introduce IT into Geography and across the whole curriculum. It is this lack of direction which causes some of the disparity between schools in the same authority.' (Ibid, p.18).

She continues,

'As time is at a premium, it would help if the dissemination of information is organised in a more coherent manner.... To find that teachers have difficulty in knowing what is happening at a local level does not leave much hope for national developments', (Ibid, p.18).

Educational Change

Change has been described as a 'generic term embracing a whole family of concepts' (Prescott and Hoyle, 1976, p.27). As such an umbrella term it subsumes concepts such as innovation, development, renewal, reform and improvement which have more precise, qualitative meanings. Some, including Stenhouse, argue that

'curriculum renewal is a matter of updating materials, of keeping pace with developments of knowledge and techniques of teaching.

Curriculum innovation involves changes in premises of teaching - its aims and values - and consequent thinking and classroom practice'

(Blenkin, Edwards and Kelly, 1992, p.30).

Innovation is distinctive to development in that it implies a radical break with former practice whereas development suggests a more gradual enhancement of it. On the other hand Rogers sees an innovation as less radical. To him it is 'an idea, practice or object that is perceived as new by an individual or another unit of adoption.' (Rogers, 1983, p.xviii). He later suggests that 'if the idea seems new, to the individual, it is an innovation.' (Rogers, 1983, p.ii). He sees it as distinctive to diffusion which 'is the process by which an innovation is communicated through certain channels over time among the members of a social system, (Rogers, 1983, p.5). In 1969, there was a conference in Cambridge on educational innovation and the definition decided upon was different again.

'We understand innovation to mean those attempts at change in an educational system which are consciously and purposefully directed with an aim of improving the present systems. Innovation is not necessarily something new but it is something better and can be demonstrated as such,' (Dalin, 1969, p.13).

Fullan (1982) identified three dimensions of change; firstly the use of new materials; secondly the use of new teaching approaches; and thirdly the alteration of beliefs such as pedagogical assumptions and underlying theories. The first two seem to correspond with Stenhouse's concept of renewal and the third to his concept of innovation. Furthermore, curriculum change can be distinguished at different levels - classroom, school, local authority and wider. The literature distinguishes between superficial and substantive change. For instance Cuban (1990) makes a distinction between first order and second order changes. First order (superficial) changes 'make what already exists more efficient and more effective,' (Cuban, 1990, p.73). and second order

(substantive) changes 'seek to alter the fundamental ways in which organisations are put together,' (Ibid).

A considerable body of literature has been generated on the process of change in educational institutions. It addresses the 'problem' for both western, first world countries but also increasingly for so called 'developing' countries. Much of this literature develops theoretical typologies or models which attempt to provide a conceptual framework for analysing the process of change. These are both empirically derived but at the same time influential on strategies for promoting change.

Coping with understanding and managing change has become a boom industry as the writings of Fullan in the educational world, (for instance Fullan, 1982, 1991) and Handy in the private sector (for instance Handy, 1991, 1995) clearly illustrate.

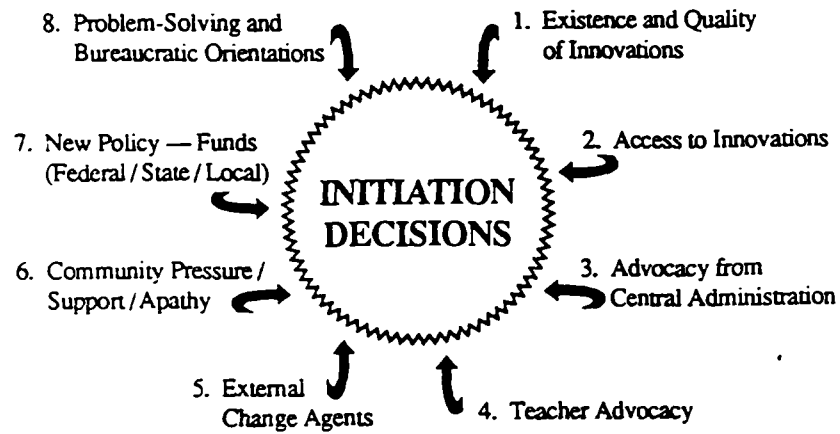
The need to understand change is often expressed. For instance Dalin argues that there is a need 'to sharpen our insight into the processes of systematic change.... and a sharper insight into the process of changes', (Dalin, 1969, p.16).

'The basic question is how you get good at change that is, how to increase the capacity of individuals and organisations to know when to reject certain change possibilities, to know when and how to pursue and implement others, and to know how to cope with policies and programs that are imposed on them', (Fullan, 1991, p.xiii).

Blenkin et al (1992) agree that such an understanding of educational change is 'essential if we are to bring about real change in the curriculum rather than that superficial form of cosmetic change with which recent years have made us all too familiar', (Blenkin, Edwards and Kelly, 1992, p.30). Most of the research discussed in this section focuses on 'planned' change not unplanned or naturally occurring changes.

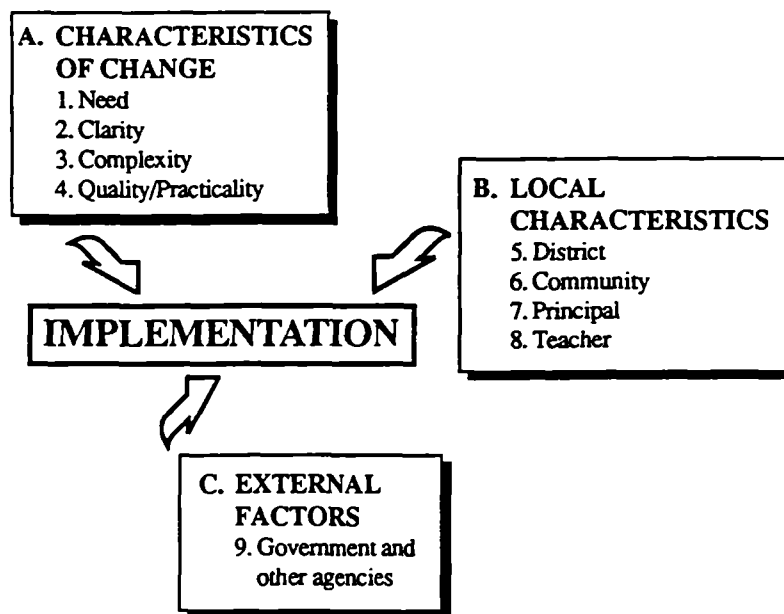
The literature agrees on one thing and that is the complexity of the change process. For instance look at the range of factors which influence whether or not changes get initiated in the first place (fig. 2.12) and those factors affecting implementation (fig 2.13). These are based on Fullan 1991 and he defines initiation as 'the process leading up to and including the decision to proceed with implementation (p.500) and implementation as 'the process of putting into practice an idea, program or set of activities and structures new to the people,

Fig 2.12 Factors Associated with Initiation



Source: Fullan (1991)

Fig 2.13 Interactive Factors Affecting Implementation



Source: Fullan (1991)

attempting or expected to change', (p.65). 'But the sheer number of the factors alone can actually only partly illustrate the complexity of the change process, as these factors interact with each other producing an extremely complex web, difficult to understand and to generalise about', (Lam, 1991).

Much research into managed curriculum change has relied over the years on the early significant work of a small number of American theorists. Of particular importance was the work of Rogers (1962), Miles (1964), Bennis, Benne and Chin (1969), Schon (1971), Havelock (1969), and House (1974). Their work is so well known that their contribution will only be mentioned briefly here. MacDonald and Walker (1976) and Blenkin et al (1992) for instance offer helpful summaries. The latter cogently argue that though dated, the work of these theorists is still important to help understand present change and new concepts, (Blenkin et al, 1992, pp.32,33).

Although Schon's work (1971) did not come from an educational context it was a highly significant early contribution. He proposed his now famous three models for the diffusion of innovation. These were the centre-periphery model; the proliferation of centres model; and the shifting centres model. In contrast Havelock focused on educational change and his typology for explaining and promoting innovation was based on studying 4000 actual instances of innovation many not to do with education. He proposed three main 'models', 'orientations' or 'perspectives' which he used to describe the dissemination and utilisation of knowledge. These he termed 'research, development and diffusion', 'social interaction' and 'problem solving'.

Bennis, Benne and Chin (1969) delineated three groups of strategies for effecting change which they categorised as empirical-rational; normative-re-educative; and power-coercive. This typology is briefly described in chapter 6, page 161. Less well known in this early curriculum change field is the work of Lewin, (1952). His force field representation made it possible to show, dynamically the magnitude and direction of change factors. All behaviour (including action, thinking, wishing, striving, valuing and achieving) was conceived as a change of some state of a field in a given unit of time. Lewin tried to develop a mature science of human behaviour. He spoke of 'driving' and 'restraining' forces. Driving forces lead to 'locomotion'. 'These locomotions might be hindered by physical or social obstacles. Such barriers correspond to restraining forces. Restraining forces, as such, do not lead to locomotion, but they do influence the effect of driving forces', (Lewin, 1952, p.259). He went on

to characterise force as 'the direction and strength of the tendency to change', (Ibid, p.256).

Since this early work there have been a number of recent and emergent theoretical perspectives. Blenkin et al (1992) argue that the complexity and diversity of the literature generated on educational change can be represented by six perspectives. These are the technological; the cultural; the micropolitical; the biographical; the structural; the sociohistorical. As Blenkin et al pointed out although each offers a unique set of insights into the change process, they clearly overlap and interrelate.

From the nineteen fifties to the early nineteen seventies the technological perspective was the dominant paradigm for studies of curriculum change. Various described as research, development and diffusion, centre-periphery or empirical-rational strategies this approach sees teaching as technology and educational innovation as change in technology. There is an assumed considerable consensus, substantial value integration and a sharing of common ends among people and users and developers are seen as having similar values. These assumptions suggest that curriculum users are rationalists who will accept and implement change without objection provided that they fully understand what the change is about. As Blenkin et al (1992) put it,

'central to the perspective is the logic of technical rationality, an epistemology of practice derived from positivist philosophy which maintains that problems of practice are technical in character and that practitioners, therefore, are first and foremost instrumental problem solvers', (p.40).

This dominant perspective on curriculum change neither produced success in practice nor provided a satisfactory explanation of the change process. Along with much positivistically driven theory it has been heavily criticised, not least for its unrealistic assumptions. For instance, it assumes that innovators and classroom practitioners construe practice in the same way. Equally important is distance between original concept (often centrally derived) and its implementation on site (in the school/ classroom). Furthermore, in this perspective, the views of innovators are considered to be inherently superior to those of classroom practitioners. If so, the ways schools work as organisations tends to be missed, obscured or downplayed. Finally, an innovation is seen as a new product that can be planned and constructed independent of its transactional context. These criticisms are to an extent valid for the early work of the School Council which at the time went along with similar simplistic assumptions and approaches.

Not surprisingly a number of alternative approaches have emerged more recently. One of these is the cultural perspective which sees teaching as a craft and assumes that society is fragmented with each group having a strong subculture. The subculture and the belief systems of the groups involved, and the cultural context are emphasised in explaining educational changes. For example Fullan (1982) asserts that 'an understanding of what reality is from the point of view of people within the role is an essential starting point for constructing a practical theory of the meaning and results of change attempts', (p.130). In contrast to the technological perspective, this approach treats educational organisations as cultural entities and emphasises less the management of change and more its meaning. As Lam remarks, 'research on curriculum change has come strongly to recognise the importance of context, culture and process', (Lam, 1991 p.21). Resistance to change can now be explained as a lack of congruence between the existing school culture and the culture embedded in the change proposals. Rudduck (1986) takes up this point by remarking that

'in our efforts to change I think we have generally underestimated the power of the existing culture of the school and the classroom to accommodate, absorb or expel innovations that are at odds with the dominant structures and values that hold habit in place', (ibid, p.7).

Some researchers within the cultural paradigm have focused on the occupational culture of teaching and attempt to assess the implications of their findings for curriculum change. Lortie (1975) for instance, describes the occupational culture of teaching as individualistic, present-orientated and conservative. Other leading exponents of this perspective include Deal (1990), Sarason (1982), Little (1990) and Broadfoot et al (1988).

Another emerging perspective on the study of educational change has been the political and in particular the micro-political. Here the key idea is that the process of educational change is seen as involving conflicts and compromise between various factional groups, such as teachers, parents and the government. Concepts of negotiation (MacDonald and Waker, 1976) and mutual adoption (Berman et al 1976) represent this approach but House (1979) has pointed out that there are great differences in viewpoints within the political perspective. For instance there is the radical approach of the Marxist and neo-Marxist school which adopts a macro-approach to the study of educational change stressing the importance of class conflict and ideology (Rice, 1982 and Papagiamis et al, 1982). An alternative new thread within the political perspective has been the micro-political which focuses on political processes at

the school and departmental level. For Hoyle (1982) micro-politics 'embraces those strategies by which individuals and groups in organisational contexts use their resources of power and influences to further their interests', (p.88). In this approach the distribution and utilisation of power in educational institutions becomes the crucial issue in attempting to understand the process of change. Schools and departments are thus the arenas of struggle whereby conflicting interests cause bargains to be struck, alliances to be formed and compromises made. Ball's (1987) work is one of the more developed in this genre. His attempt to provide a theory of school organisation is grounded in three theoretical positions. Firstly, that formal organisations frustrate healthy individuals (frustration); secondly, that individuals join formal and informal school groups (conflict); and thirdly, that routines of social life rests upon negotiated agreements between and among individuals and groups (negotiation). Thus according to his theory schools are organisations that frustrate individuals, are homes for various and competing groups and are characterised by a negotiated social order. Particularly relevant from the perspective of my research is the focus on subject departments as a most significant organisational and political division within the secondary school, (Ball, 1989). Dalton's 1988 research shows that departments when engaged in innovation can be places of conflict based upon differences in ideology and personality and not necessarily subject allegiance. Holt's interesting 1990 study of a school committed to innovation highlighted the conflicting interests and political manoeuvrings within and between committees suggesting that even in schools committed to a general policy of innovation, vested interests often prevail over the common good. This micro-political perspective provides no magic key for bringing about change in schools, but does provide useful insight into some of the inherent difficulties.

The biographical perspective examines change through the biographical experiences of individual practitioners in terms of their hopes, aspirations, fears, commitments, beliefs and values. As Blenkin et al (1992) remind us 'Its analytical framework includes personal construct and social interactionist theory; its methodologies utilise interview, questionnaire and observation and more recently, autobiography, narrative and story', (p.55). In particular Morris's work (1974) brings to the fore the psychological processes through which individuals make sense of the world and how they learn. Morris speaks of the 'conservative impulse claiming that there is a deep-seated impulse in all of us to defend the validity of what we have learned, for without it we would be helpless, (1974, p.8). A range of studies under this perspective focus on teachers' lives and careers, (Ball and Goodson, 1985; Goodson, 1991; Goodson and Walker,

1991). This biographical perspective suggests that success of an innovation depends on the material and psychological support that individuals and groups can be offered.

The structural perspective on the other hand is underpinned by the notion that education is embedded in and a reflection of, wider economic, social and political structures. Hargreaves (1989) for instance, offers such an interpretation of educational change in Britain over the last forty years. He argues that change during this period can be understood through three educational crises corresponding closely to the three social crises of the modern capitalist state as proposed by Habermas, (1976). He labels these crises 'administration and reorganisation' ('rationality' according to Habermas); 'curriculum and belief' ('legitimation' according to Habermas); and 'motivation and assessment' ('motivation' according to Habermas).

At the micro level of the school and classroom the structural perspective identifies a range of structures over which teachers have limited control. These would include national and local government policies, resources, examination requirements, social expectations, pupil and parental expectations and class sizes. Arguably the recent most influential structures impacting on teachers' lives are those of curriculum and assessment.

A final perspective is the sociohistorical which owes much to the work of Goodson (1987) and attempts to understand 'where subjects come from and why they were as they were', (p. viii). His central thesis comes from the proponents of the sociology of knowledge who suggest that the curriculum provides the means whereby the dominant groups in society are able to maintain a position of power by exercising control over subordinate groups. Of particular interest to my research is that Goodson's work in 1981 analysed geography as an academic discipline and school subject and in 1983 he studied the efforts to establish 'environmental studies' and the role of geography and biology as contrasting influences. He concluded that 'much of the curriculum debate can be interpreted in terms of conflicts between subjects over status, resources and territory', (Goodson, 1987, p.3). This intra subject conflict is a central focus of Goodson's work.

In addition to these seven relatively more recent perspectives and responses to the weaknesses of the technological approach, there has been recent great emphasis on implementation studies. By investigating the implementation process it is argued that theorists and developers will be better able to



understand curriculum change. Such studies have focused on the role of organisations, actors (particularly teachers), barriers and key positive and negative factors influencing change or lack of it.

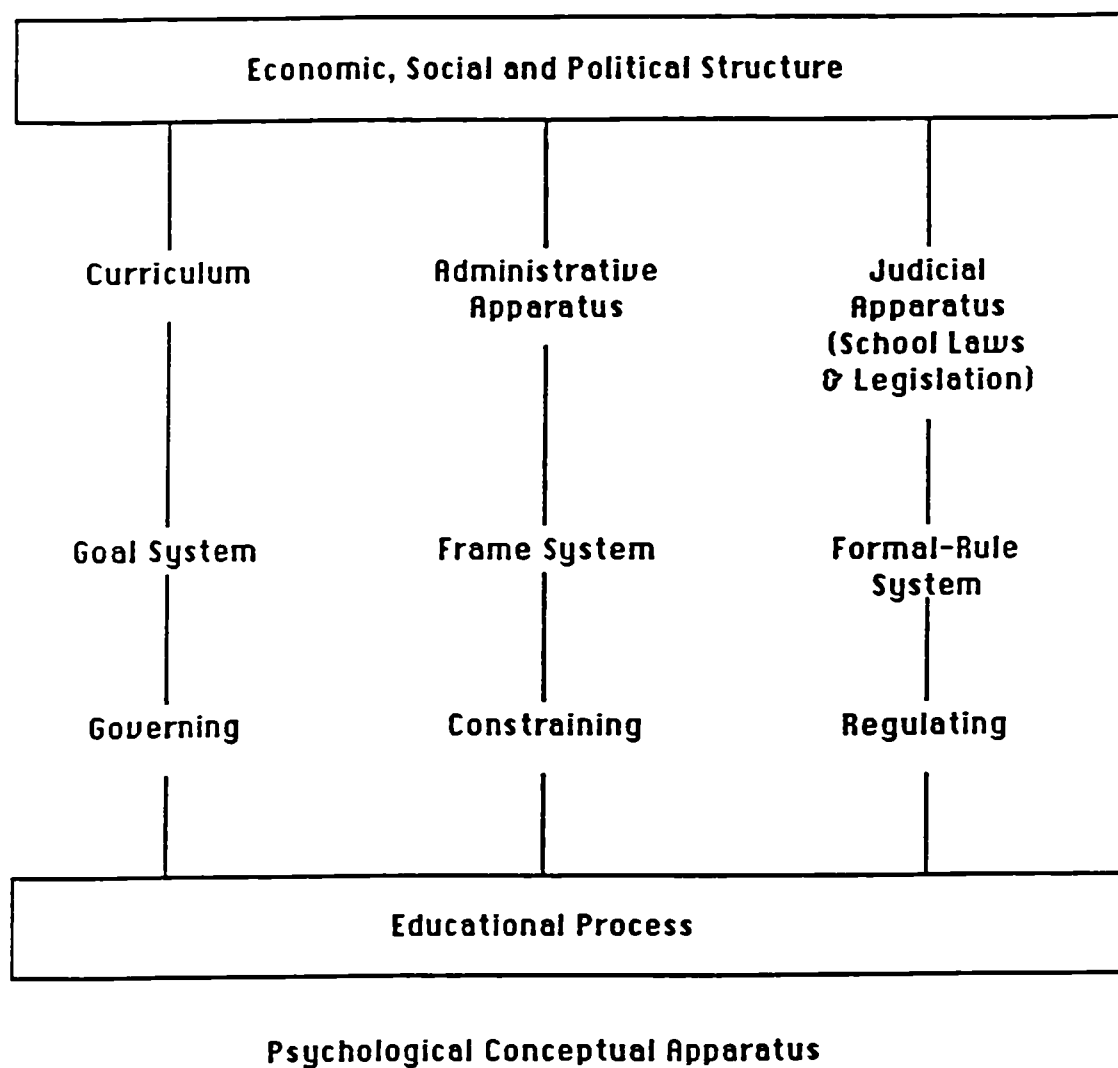
Important studies of the school as an organisation include Hoyle (1973) who discusses major sociological theories and methods of organisational investigation; Bidwell (1965) who seeks to identify certain generic attributes of school organisations; Davies (1973) who provides a sociological critique of organisational theory; and Gray (1985) who is concerned with developing the idea of the school and college as an organisation. Perhaps most directly relevant to my research is Lundgren's frame factor theory (1982) which is a conceptual tool to identify the different levels that exist in the educational system and identifies different aspects of the organisation that influence teacher activity, in this case the use of CAL. Frames, as used by Lundgren, are boundaries which are established at different levels about the teaching process. Three levels or units were identified:

1. The teaching level/unit
2. The school level/unit
3. The educational system level/unit

The decision made at level 3 will thus be the frames for decisions on levels 2 and 1 and the decisions on level 2 will act as the boundary for any possible decision on level 1. In some situations some aspects may act as fixed factors, in other situations they may be variable and open to manipulation. Lundgren saw the teaching process as context bound. It was seen as being determined by rules that regulate (the formal rule system), frames that form a boundary (the frame system) and goals that govern (the goal system) the teaching process. The links between the various systems are shown in fig. 2.14. These three systems are thus socially defined and are brought to bear on the teaching process as a matter of school organisation. They are the products of decision making at the institutional and social levels. Teacher perception, pupil role and the structure of teaching itself are formed by the interplay of these governing, constraining and regulating factors. Thus according to Lundgren, the educational process is linked both to the pedagogical conceptual structure and the psychological conceptual structure.

A key organisation, supposedly encouraging change, is the teachers' centre and Weindling, Reid and Davis (1983) undertook research into these. Amongst their findings were that 'both the survey data and the case studies indicated that a major emphasis was on courses and curriculum groups', (p.153) and that

Fig 2.14 Lundgren's Frame Factor Theory



Source: Lundgren (1982)

'they are not only acceptable to teachers but are preferred by them over any other INSET provider', (p.164).

The change literature, is full of research into various 'actors' within the education system. Some of the related models I found particularly useful for making sense of my data and I have detailed these in chapter 6. In particular they are: adopter categories, (Rogers, 1962); typology of linking roles, (Havelock, 1969); continuum of teacher sub-cultures, (Dalton, 1988); leadership styles, (White and Lippitt, 1968); and attitude classification, (Chandra, 1986).

Fullan's latest book (1991) has a chapter on each of the key actors at the local level. These are: the teacher; the principal; the student; the district administrator; the consultant; and the parent and the community. There is a considerable literature on each of these types and that is certainly true of the principal. Hall and Horde (1987) claim that 'there is a general consensus in the literature that the principal is the key to educational change in school', (p.42) given that he/she being the head of the school, normally has the final say in decisions over the adoption, implementation and institutionalisation of curriculum change at the school level. However it is generally agreed that when it comes to the classroom level, teachers have the key role in implementing change. Whatever changes occur must come from the teachers themselves. In the final analysis, it is they who control what goes on with students. Unless teachers change, there will be no change, as many a frustrated administrator or supervisor can attest from sad experience. Teachers need to understand their crucial position as agents of change', (Combs, 1979, p.210). 'Ultimately the most fundamental form of innovation is the transformation of the values of teachers', (Hoyle, 1971, p.218). Indeed Dalton's study of how GYSL was implemented in two schools suggested to him that, 'an analysis of teachers' present perceptions is therefore central to the understanding of curriculum development', (Dalton, 1988, p.8). Equally Rudduck (1991) argues that 'Teachers must feel as individuals and as members of a working group that they own and are in control of the problem of change', (p.31). She lays great stress on the 'ownership' by teachers of the change.

'Real curriculum development will not be achieved by teachers who feel so used and acted upon. They have got to feel some control over the situation and, in order to feel a sense of control, they have to recognise what it is in schools classrooms and in themselves that they want to change. They have to understand, at the level of principle, what they are trying to achieve, why they are trying to achieve it it is not

easy, however, to help teachers to arrive at such complex understandings', (Ibid, p.92).

As she repeats, 'Ownership quickly becomes a key term in the new language of change', (Ibid, p.123).

Bolam et al (1976) study the role of LEA advisers in educational innovation and consider that 6 of the nine roles termed linkage agents by Havelock (1969) are relevant for them. Bolam et al speak of conveyor, consultant, trainer, leader, innovator and defender as of particular relevance, (Bolam,1976). Havelock's typology is detailed in chapter 6 but suffice it to say here that the concept of change agents, probably first introduced by Hoyle in 1971 is a useful one. Stillman and Grant (1989) also consider the changing role of the LEA adviser as part of a major NFER study which set out to examine the roles and responsibilities of advisers from different perspectives within the LEA.

A further part of the change literature looks at barriers to change. Combs for instance in 1979 details a host of myths which have achieved general acceptance. He defines these myths as 'incorrect or inaccurate beliefs which are popularly regarded as being true', (Combs, 1979, preface). The subtitle of the book is 'beliefs that hinder progress and their alternatives'. Again in the preface he remarked, 'I have concluded that the myths we firmly believe are the greatest current source of failure in our public schools. They are also our greatest deterrent to innovation and change..... the insidious thing about myths is people believe they are true.' The myth 'they won't let me' he sees as a handy excuse for inaction. Other examples of myths he relates are that knowledge is stable and that the teacher should be the infallible disseminator of information. As he concludes 'all of us including teachers..... have far more freedom to innovate than we really like to believe', (Combs, 1979, p.209). Dalin (1973) makes the following typology of barriers based on his analysis of educational change:

1. Value barriers. People and groups attach different values to things, causing conflicts which may act to prevent the spread of an innovation.
2. Power barriers. These are barriers resulting from power redistribution in the system, which is often a result of significant innovation.
3. Practical barriers. Innovations may sometimes fail because they are badly conceived, or barriers may result from inadequate

management of the innovation process, resulting in unwanted practical problems for individuals and groups.

4. Psychological barriers. These constitute highly important pitfalls in the implementation of reforms. We often speak of 'resistance to change' when referring to some people's inability to move from a familiar situation to an unfamiliar one. Yet on the other hand there are other people in schools who do try and bring about change.

Finally the change literature includes elements that lay out the circumstances needed for change to occur. Williams and Williams (1994) for instance identify 9 factors which they believe to have a significant influence in determining the successful adoption of a new educational initiative. These were based on their in-depth study of the adoption phase of the curriculum innovation introduced at a large comprehensive school in northern England. The nine factors were (Ibid pp. 204-214) quality of innovation; access to information; advocacy of the Chief Education Officer; teacher advocacy; pupils perceptions; linking agents - HMI and LEA advisers; community involvement; availability of government funds; and problem solving orientations. Similarly Fullan (1991) identifies 8 factors associated with initiation of an innovation. This can be diagrammatically represented in fig 2.12. He went on to say in an article in the Times Educational Supplement (9/10/92) that he, alongside his Canadian colleagues Matt Miles and Andy Hargreaves, drew eight lessons about the complexity of educational change. The eight are as follows: Governments can't mandate what matters; change is a journey not a blueprint; problems are a positive influence; vision and strategic planning come later; individualism and collectivism must have equal power; neither centralism nor decentralism works; connection with the wider environment is critical; every person can contribute to change. He reckons the challenge of change in a general sense is to master the eight lessons of change as a basis for action. He sees four core capacities needed; personal vision building; inquiry (or continuous learning); mastery; and collaboration. Each of these has its institutional counterpart; shared vision building; organisational structures, norms and practices of continuous inquiry; focus on organisational development and know-how; and collaborative work cultures.

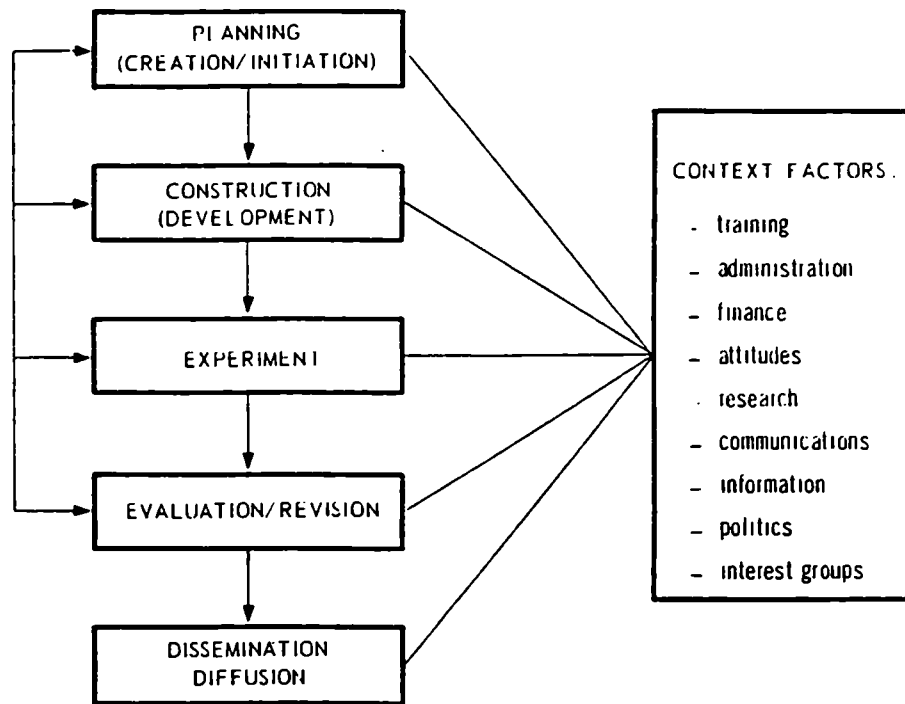
At a lecture at the Institute of Education, London, on 12/10/92, Fullan spoke of 6 key barriers to educational reform. These were: overload, he argues caused most recently by a surfeit of ideas and policies generated by the political process; lack of clarity (Lam, 1991 pp. 29/30 develops this point); complexity, to do with the degree and amount of change involved; incompatibility that is

whether teachers are philosophically compatible or not with the change; capability, that is the requisite skill and know-how of the teacher force; and resources including time, ideas and access to expertise. Lam (1991) considers support for teachers as a similar and very important factor, (Ibid, pp. 33-36).

Other aspects of the change literature focus on stages in the process of change. Rogers (1983) and Fullan(1991) are particularly important and are considered in chapter 6. Dalin (1969) has another view and his model is shown in fig. 2.15.

Informed by this literature review, I had to decide on a research focus and as a result the most appropriate research methodology and strategy, the subject of the next chapter.

Fig 2.15 The Process of Innovation in Education



Source: Dalin (1989)

Chapter 3

Research Focus and Approach Taken

What began to interest me from the early nineteen eighties onwards was the process whereby schools took on or failed to take on an identifiable innovation. This 'identifiable' innovation was the use of computer assisted learning (CAL) in the teaching of geography. Throughout I was on the look out for 'active' departments where CAL was used. Indicators of activity were; use of CAL in the geography classroom; teachers' related awareness and understanding of recent developments; and the availability of software and hardware. Although this innovation has unique characteristics I was constantly most focused on the processes leading to its adoption and implementation which were not 'CAL specific', though of course some were. From the start I identified and studied 'environments' and 'actors' associated with the change process. Environments considered were department, school, LEA, MEP region and government. Actors studied were classroom teachers, heads of department, in school coordinators of IT, head teachers and LEA advisers. As the research evolved, the environment I homed in on became the department and the actor most targeted was the head of department. That is not to say that other environments and actors were ignored.

Increasingly, as the research evolved, I became convinced of the 'linchpin' nature of both head of department and department itself in affecting and effecting change. Ball (1989), Dalton (1988) and in the case of geography education, Warner (1984) have spotlighted the department's key role. Indeed there is a whole literature on teamwork, for example Adair (1985), Kemp (1989) and Brown (1979); and leadership for example Brighouse (1991), Bayne-Jardin and Hannam (1972) and Juett (1989) which stress the critical function of middle managers (heads of department) and their sections (departments) in the successful operation of organisations.

CAL geography fits in with Rogers' notion (as described in chapter 2) of an innovation as 'an idea, practice or object that is perceived as new by an individual or other unit of adoption,' (Rogers, 1983, p. xviii). It involves a radical break with former practice since it demands rethinking classroom practice and to an extent the power balance between teacher and student as this is far from being just a superficial 'technical' change in pedagogy.

Throughout this research and before I even began it, I have been convinced of the importance of understanding innovation and change processes so that change can most effectively be brought about and coped with by everyone within the educational system. This is particularly important since change is a permanent feature of our modern world and certainly of the education world. Graves pointed to the desirability and inevitability of change in his Presidential Address to the Geographical Association in 1979, 'We cannot expect from the point of view of geographical education any marked deceleration of the intellectual rate of change. Such deceleration might herald stagnation', (Graves, 1979, p. 266). As noted in chapter two according to Fullan, 'the basic question is how you get good at change', (Fullan, 1991, p. xiii). Other arguments for a better understanding of change are rehearsed on page 42. As Fullan exhorted in 1992,

'We do not have the choice of avoiding change just because it is messy. One way or another, new policy requirements, new technologies, changes in personnel, demographic shifts, political interest groups inevitably encroach on the status quo. We are badly in need of a new mind-set and lines of action that will enable us to survive and have a chance of progressing under these complex, less than helpful conditions', (Fullan, 1992, TES).

So studying change is important work and as we have seen in chapter two it is a complex phenomenon. That is why I have found this research both worthwhile and challenging.

To state my research question in one sentence, **it is to determine what processes lead to the success or failure of the implementation of an innovation.**

Before discussing the approach I took to the research, it seems important to restate the nature and point of educational research. As Drew reminds us 'research is conducted to solve problems and to expand knowledge', (Drew, 1980, p. 4) and 'is a systematic way of asking questions, a systematic method of enquiry', (ibid., p. 8). I most like Mouly's definition of research as being

'best conceived as the process of arriving at dependable solutions to problems through the planned and systematic collection, analysis and interpretation of data. It is a most important tool for advancing knowledge, for promoting progress, and for enabling man (sic) to relate more effectively to his (sic) environment, to accomplish his purposes, and to resolve his conflicts', (Mouly, 1978, p. 29).

My research framework has developed over several years as can be seen from figures 3.1, 3.2, and 3.3. The research evolved in the way Bechofer described it: 'The research process, then, is not a clear cut sequence of procedures following a neat pattern, but a messy interaction between the conceptual and empirical world, deduction and induction occurring at the same time', (Bechofer, 1974, p. 73). Bryman and Burgess explain the messiness of research:

'Here the difficulties involved in doing research and writing about it are vividly portrayed through the use of the word 'messy'. Indeed, research seldom involves the use of a straightforward use of procedures. Instead, the researcher has to move backwards and forwards between different sequences in the research process. For example, in designing a project, consideration needs to be given to the end-point and the concepts and theories that will be used in data analysis. Similarly, in terms of data collection, reference has to be made to the comparisons and contrasts that may be uncovered during a project. On this basis, there is not a sharp divide between different aspects of the research process in practice', (Bryman and Burgess, 1994, pp. 2-3).

This 'messiness' and the to-ing and fro-ing of the research process certainly describes my research.

As it evolved I have moved away from a focus on nationwide level data, for instance my LEA advisers questionnaire and interviews with national level 'actors', towards the level of the department studied at greater depth. Similarly I have become more interested in the change process over time and so the temporal frame moved from a three year context to the context of almost a decade. I also soon realised that even at the school/departmental level, I had too much data. As I began to analyse the data for the three local education authorities (see chapter 5) I sought ways of narrowing the data to be used and analysed in depth. Fortunately the data across LEAs was so contrasting that the narrowing down decision was relatively painless. Although I was committed to multi-site case studies I reduced the sites for in-depth studies from 15 to 7 as explained in chapter 5.

What type of research is this? This is not as easy to answer as it is to state since research paradigms, classifications and related terminology are somewhat confused and confusing. It certainly is curriculum oriented research and consequently my early research frameworks owed a great deal to the book by Bastiani and Tolley on *Researching into the Curriculum* (no date). Their

Figure 3.1

Computer Assisted Learning and Secondary School Geography 1982-1985: A study of the process of curriculum change.

Research Foci

1. What is the nature of the processes of diffusion, adoption, impact and implementation of the innovation (ie the micro computer in geography classrooms) between and within LEAs?

With reference to:

- a) The interaction between central agencies, LEA advisers and teachers.
 - b) The response of geography teachers to this innovation.
 - c) The 'effectiveness' (eg take-up, diffusion of good practice) of the government sponsored curriculum development (ie MEP - Microelectronics Education Programme).
2. In the light of this evidence, insights for future, planned curriculum developments.

Research Methodology and Style

Methodology:	Action Research a) Questionnaire surveys of LEA advisers b) Case studies at a local level.
Scale of Focus:	National level with questionnaires Local level continuously over 3 year period.
Kinds of Evidence:	Questionnaires Interviews 'Documentary' evidence eg film Subjective accounts
Research Style:	Essentially illuminative apart from the 3 national questionnaire surveys.
Politics of Research:	Curriculum studies publication (s) Wide educational audience including advisers and geography teachers.

Research Sequence

Questionnaires to 100+ LEA Advisers

3 snapshots in time: Spring 1982, Spring 1983, Spring 1984.
To determine extent/nature of innovation/change.

- | | |
|------------------|----------------------------------|
| 3 main sections: | A. Computing and the LEA |
| | B. Geography Teaching in the LEA |
| | C. Views on CAL and geography |

Analysis of Questionnaires followed up by

Case Studies

Continuous study 1982-4 of two LEAs.
Choice determined by analysis of 1982 questionnaires
Interview and observation methods developed
Profiles built up of: courses, links with MEP regional centres, advisers, geography teachers, curriculum meetings.

Model of Curriculum Change

Developed by empirical observations but with a normative element.
Use as future planning model.

Fig 3.2

Revised August 1983

A Study of the process of curriculum change.

Computer Assisted Learning and Secondary School Geography 1982-1985:

Research Foci

1. What is the nature of the processes of diffusion, adoption, impact and implementation of the innovation (ie the micro computer in geography classrooms) between and within L.E.A.s?

With reference to:

- A. The interaction between central agencies, L.E.A. advisers and teachers. (actors)
- B. The response of geography teachers to this innovation.
- C. The impact (eg take-up, diffusion of good practice etc) of the government sponsored curriculum development (ie M.E.P.- Micro Electronics Education Programme).

2. In the light of this evidence, insights for future, planned curriculum developments.

Research Methodology and Style

- Methodology: a) Questionnaire surveys of L.E.A. advisers
 b) Case studies at a local level.
 c) Interviews with leading individuals/organisations.
- Scale of Focus: National level with questionnaires/also interviews.
 Local level continuously over 3 year period.
 Possible international dimension.
- Kinds of Evidence: Questionnaires. Group discussions.
 Interviews. Diaries.
 'Documentary' evidence eg tape
 Subjective accounts (eg of teachers meetings/conferences)
- Research Style: Essentially anthropological apart from the 3
 national questionnaire surveys. ie more phenomenological
 than quantitative/also inevitably participant observation
- Politics of Research: Curriculum studies publication(s)
 Wide educational audience including advisers
 and geography teachers.

Research Sequence

Questionnaires to 100+ L.E.A. Advisers

3 snapshots in time: Summer 1982, Summer 1983, Summer 1984,
To determine extent/nature of innovation/change.

- 3 main sections: A. Computing and the L.E.A.
 B. Geography Teaching in the L.E.A.
 C. Views on C.A.L. and geography
 (Follow up of some by interview)

Fig 3.3

RESEARCH OUTLINE

REVISED MAY 1985

THE PROCESS OF CURRICULUM CHANGE

- THE STUDY OF COMPUTER ASSISTED LEARNING

IN SECONDARY SCHOOL GEOGRAPHY 1982-1985

Research Focus

[The process of adopting a curriculum innovation at the school and LEA level]

With reference to:

- a) The interaction between 'actors' and 'environments' in the school and LEA contexts.

'Actors' to include: teachers, advisers, inspectors, headteachers, heads of geography departments, head of computer studies, chief education officers etc.

'Environments' to include: a school, a department, an LEA, a teachers or curriculum development centre, MEP region etc. (Positive and negative influences)

- b) The response of geography teachers to the innovation - adopters, non adopters, adapters, laggards etc.
- c) The success/or otherwise of outside agencies preventing/causing adoption especially:- MEP, local courses/conferences, meetings, G.A. branches, LEA and central government policy, redeployment/closure policies, pay disputes etc.

In the light of this evidence, insights for the future encouragement of such curriculum development at the school and LEA level.

Research Methodology and Style

- Methodology
- a) Questionnaire surveys of LEA advisers nationwide
 - b) Questionnaire surveys of teachers in 3 regions of England
 - c) Interview case studies with teachers/advisers in 3 London LEAs
 - d) Interviews with other individuals/organisations

Scale of Focus:

National level with questionnaires and some interviews.

Regional level with questionnaires

Local level with interviews with teachers/advisers

International dimension (through IGU?)

Kinds of Evidence:

Questionnaire surveys

Interviews (from tapes or notes)

Documentary evidence e.g. minutes of meetings, the literature etc.

Research Style:

A 'triangulation' of styles but more phenomenological than quantitative. A conscious element of participant observation is involved.

Politics of Research:

Thesis

Curriculum Studies publication(s)

Potentially wide educational audience including computing/geography advisers and teachers. Those interested in educational computing.

Research Sequence

1. Questionnaires to +100 LEA advisers
2 snapshots in time: summer '82, summer '83 to determine extent/nature of innovation/change
3 main sections:-
A. Computing and the LEA
B. Geography Teaching in the LEA
C. Views on CAL and geography
2. Similar questionnaires given to teachers in 3 regions of England 1981-83
3. LEA advisers questionnaire May 1985 (K. D. Thomas)
4. Interview case studies 1983-1985
Choice of LEAs and schools made
Interview approach developed
Profiles of teachers/schools/LEAs built up
5. Description and Analysis of data (late 1985)
6. Model for curriculum/change based on the case studies, built up (late 1985)
Possible use as a future planning model.

W. A. Kent
May 1985

Analysis of Questionnaires conducted at same time as:

Case Studies

Continuous study 1982-85 of three L.E.A.s

Choice determined by analysis of 1982 questionnaires and other factors.

Interview and Observation Methods developed.

Profiles built up of: courses, links with M.E.P. regional centres, HMI,

advisers, geography teachers, curriculum meetings, national organisations
eg Chelsea College

Model of Curriculum Change

Developed by empirical observations but with a normative element.

Use as future planning model.

W A Kent

August 1983

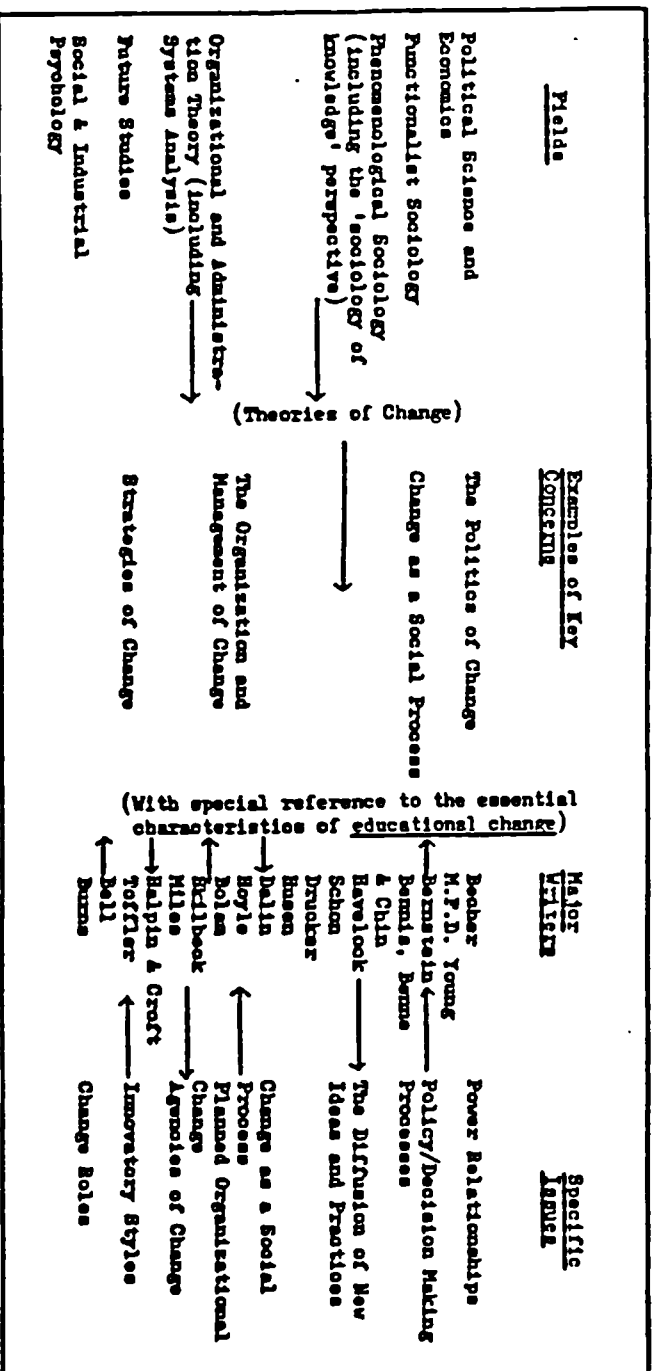
categories of curriculum research were: surveys; evaluation studies; classroom interaction studies; analysis of curriculum materials; strategic studies; language studies; and action research. My research fits, if anywhere in their classification, into the strategic studies type. 'A major emphasis, in such research, is upon the portrayal of curriculum systems and processes. A major purpose is to describe, analyse and interpret the processes of innovation and change', (Bastiani and Tolley, no date, p. 31). Their diagram (fig 3.4) 'is intended to suggest a frame of reference within which certain kinds of research proposals can be explored and located in appropriate theory. It begins to be possible, in this area, to envisage ways in which theory and empiricism can become mutually illuminating and supportive', (Ibid., p. 29).

A somewhat simpler yet still useful categorisation of research methodology was proposed by J. Harland in a lecture to PGCE students at the Institute of Education, University of London on February 14th 1995. She suggested that there were three broad research approaches and those were talking (interviews, questionnaires, diaries); watching; and looking at records. Clearly my research fits into the first category.

A broader typology of educational research is the distinction between normative and interpretive paradigms. 'The normative paradigm (or model) contains two major orienting ideas: first, that human behaviour is essentially rule-governed; and second, that it should be investigated by the methods of natural science. The interpretive paradigm is characterised by a concern for the individual. Whereas normative studies are positivist, all theories constructed within the context of the interpretive paradigm tend to be anti-positivist', (Cohen and Manion, 1985, pp.38-39). Again my study sits more comfortably in the interpretive camp.

Recently Slater (1996) has tabulated research paradigms in the light of her experience in geographical education. Figure 3.5 shows the four categories and again my research fits most happily within the interpretive section. However these paradigms overlap and individual pieces of research do not always fit neatly into typologies of research. For instance my research has an underlying action research stance, that is it is intended to lead to 'improvements' in systems through the insights gained. Slater suggests there could be a hybrid fifth paradigm to cope with this overlap problem. 'I could add a fifth category named 'mixed frame' or 'controlled action' research, or other words intended to convey a fusion of scientific, interpretive and action research traditions', (Slater, 1996, p. 314). She points to the essentially transient nature

Fig 3.4 A Frame of Reference for Strategic Studies



Source: Bastiani and Tolley (no date given)

Fig 3.5 Research Paradigms Tabulated

Framework	Aim	Methodology	Techniques
Scientific	To test relationships among variables, to understand interrelationships, to describe, explain, predict	Inductive or deductive, hypothesis formulation	Experimental, testing, pre-test, post-test formulac, hypothesis testing, observation and survey
Interpretative	To find meaning, to illuminate meaning in written and spoken accounts, past and present events and situations and interactions among people, to portray, to paint a picture	Anthropological, ethnographic, phenomenological, case study, context respecting	Observation, note-taking, interviewing, (structured and unstructured, semi-structured), conversation, diary-keeping, illuminative descriptions, thick descriptions
Action	To effect an improvement by action within a situation alone or with others	Critical stance, working within a situation	Acting, observing, refining and replanning
Postmodern	To highlight the 'constructedness' or contingency of knowledge, to draw attention to the hidden agendas of knowledge claims	Working within a situation, case study, ethnographic, critical stance, self-reflexive, foregrounding of researcher subjectivity	Experiments with writing that blur the boundary between facts and fiction, textual analysis, collaborative research and collective authorship of research texts

Source: Slater (1996)

of these classifications, 'Our frameworks dissolve and re-form as we wish, and as we develop and as we learn to evolve traditions and meanings for different purposes', (ibid. p. 315).

Qualitative research has boomed in the last few years. As Miles and Huberman remark in the introduction to their latest book, 'The expansion of qualitative inquiry since the first edition of this book (Miles and Huberman, 1984) has been phenomenal. The base of books, articles and papers we collected for this second edition has more than tripled over that for the first', (Miles and Huberman, 1994). Indeed even by 1984 this trend was well underway and remarked upon by Professor H. Francis in her inaugural lecture at the Institute of Education, University of London in June 1984. In this address she considered how the psychometric model in educational psychology had failed to illuminate the case of the individual learner. Consequently she felt that 'a grounded educational psychology, based in recognition of the individuality of the learner and in fidelity to the phenomena of everyday experience, may best serve pupils and teachers', (Francis, 1984, p. 22). She went on to call for 'a more subjective epistemology (in contrast) to the very objective one of previous psychological research, at least to the extent that subjective reports are incorporated in structural descriptions', (ibid., p. 23).

Similarly in a recent geographical education research publication Williams speaks of the 'growth in naturalistic inquiry with a focus on research which emphasises meaning, insight and understanding', (Williams, 1996, p. 3).

Terminology is a problem with this explosion in qualitative inquiry over the last few years and 'ethnography, field methods, qualitative inquiry, participant observation, case study, naturalistic methods, and responsive evaluation, have become practically synonymous', (Miles and Huberman, 1994, p. 1 referring to Smith, 1992). At this stage it is necessary to consider the recurring features of qualitative research. The core features identified by Miles and Huberman were as follows:

- * *Qualitative research is conducted through an intense and/or prolonged contact with a 'field' or life situation. These situations are typically banal or normal ones, reflective of the everyday life of individuals, groups, societies, and organisations.*
- * *The researcher's role is to gain a 'holistic' (systematic, encompassing, integrated) overview of the context under study: its logic, its arrangements, its explicit and implicit rules.*

- * *The researcher attempts to capture data on the perceptions of local actors 'from the inside,' through a process of deep attentiveness, of empathetic understanding (Verstehen), and of suspending or 'bracketing' preconceptions about the topics under discussion.*
- * *Reading through these materials, the researcher may isolate certain themes and expressions that can be reviewed with informants, but that should be maintained in their original forms throughout the study.*
- * *A main task is to explicate the ways people in particular settings come to understand, account for, take action, and otherwise manage their day-to-day situations.*
- * *Many interpretations of this material are possible, but some are more compelling for theoretical reasons or on grounds of internal consistency.*
- * *Relatively little standardised instrumentation is used at the outset. The researcher is essentially the main 'measurement device' in the study.*
- * *Most analysis is done with words. The words can be assembled, subclustered, broke into semiotic segments. They can be organised to permit the researcher to contrast, compare, analyse, and bestow patterns upon them, (Miles and Huberman, 1994, pp.6-7).*

These eight characteristics are true of my research.

Wolcott (1990) considered that ethnographic research is undertaken, '*In a culture that is unfamiliar to the researcher; by an individual rather than a large research team; in a setting that permits observation of a full cycle of events (rather than on a short term basis); in such a way that the researcher serves as the primary research instrument; so that the researcher employs many of the techniques used by anthropologists in a way that allows as much time for analysis and interpretation of information as for collection of information'*, (Wolcott, 1990,p.F.3).

Why then has qualitative inquiry become so popular?

'Qualitative data are sexy. They are a source of well-grounded, rich descriptions and explanations of processes in identifiable local contexts. With qualitative data one can preserve chronological flow, see precisely which events led to which consequences, and derive fruitful explanations. Then, too, good qualitative data are more likely to lead to serendipitous findings and to new integrations; they help researchers to get beyond initial conceptions and to generate or revise conceptual frameworks. Finally, the findings from qualitative studies have a quality of 'undeniability.' Words, especially organised into incidents or stories, have a concrete, vivid, meaningful flavor that often proves far more convincing to a reader - another researcher, a policymaker, a practitioner - than pages of summarized numbers' (Miles and Huberman, 1994, p. 1).

Yet there are a number of issues indeed criticisms, of such research and some of these were well summarised by Schratz,

'By paying more attention to the original voices of the actors in everyday life they tried to make room for a broader view of the social reality of their research. This has led researchers to break with some of the established conventions of objectivity, reliability and validity' (Schatz, 1993, p. 1).

As early as 1979 Miles had remarked that 'the most serious and central difficulty in the use of qualitative data is that methods of analysis are not well formulated', (Miles 1979, p.591). This was reinforced by Bryman and Burgess who remarked that, 'the challenge for qualitative researchers in the next decade is to articulate as fully as possible the processes associated with data analysis', (Bryman and Burgess, 1994, p.224).

To recap, this present research is curriculum oriented, qualitative and interpretive. However the key research strategy I engaged in is an important subset of these, that it is case study research. Case study research is not new since it was in 1976 that a conference was held in Cambridge on 'Case Study Methods in Educational Research and Evaluation.' The definition adopted by the conference was that 'case study is an umbrella term for a family of research methods having in common the decision to focus an inquiry round an instance', (Adelman et al, 1980 pp. 139-50). Nisbet and Watt suggest a shorter definition, 'a systematic investigation of a specific instance', (Nisbet and Watt, 1980, p5). A good deal of literature has been generated on case study research including Nisbet and Watt,(1980), Adelman et al, (1980), Simons (1980), Bassey (1981)

and Yin (1984). A number of pieces of research focusing at least in part on geography education have adopted a case study approach. Examples include Dalton (1988), Naish (1994), Parsons (1987), Roberts (1995) and Milton (1984). The latter is an early example of case study oriented research undertaken by MA students at the Institute of Education, University of London. Roberts (1996) work provides a recent consideration of the strategy for geographical education in which she outlines the nature of such research, why it is used and the problems associated, (Roberts, 1996, pp.135-138).

Given the full documentation of the case study approach, its nature, strength and weaknesses, I do not intend here to rehearse such material. Suffice to say that 'The diagnostic power of in-depth case study work will help to review the whole picture including the underlining structure, teachers' perceptions, the complexity of the interaction of the users, the context of change, the implemented curriculum and the decision making process of teachers,' (Lam, 1991, p63). Simons (1980), Shaw (1978) and Stenhouse (1980) have all pointed out the advantages of using case studies in curriculum evaluation and curriculum change studies. Adelman et al (1980) are particularly convincing in their laudatory claims for the strategy. They speak of the 'peculiar strength' of case study being its focus on 'the subtlety and complexity of a case', (ibid p.59) and 'down to earth attention holding, in harmony with the readers' own experience', (ibid p59). Roberts indeed has recently argued that,

'Geographical education could benefit from more case study research, in spite of the problems involved in carrying it out. There is scope for case study research at a variety of scales and on a range of topics.....The in-depth study of particular cases offers enormous potential for increasing our understanding of geographical education,' (Roberts, 1996, p.148).

Milton (1984) and McElroy (1980) are particularly good examples of previous MA research in geographical education supporting this suggestion.

The literature is not only full of the nature and advantages of case study research but of its disadvantages. Ball in the introduction of his study of Beachside Comprehensive summarises some of the problems of case study: 'The case study seeks to offer an approximation to reality in the portrayal, which is derived from the experience of a single research worker, with all the problems of bias, selection and chance that this entails,' (Ball, 1981, p.xviii). Yin too outlines his critique as ,

'lack of rigor of case study research. Too many times, the case study investigator has been sloppy and has allowed equivocal evidence or

biased views to influence the direction of the findings and conclusions..... take too long and result in massive, unreadable documents.... provide very little basis for scientific generalisations,'
(Yin, 1984, p.21).

These represent some of a long list of concerns to do with this research strategy. My own list, partial as it inevitably must be, would be:

- increasing difficulties of access to subjects and cases
- represents a 'partial' portrait
- subjectivity and bias of researcher
- reliability
- validity
- observer influence
- generalisability / typicality
- a range of ethical concerns

I will address these later in the chapter concerning my own case study approach and procedure. These are well rehearsed concerns but three others raised by Walker in 1983 were that:

- a) *case-study research is an intervention, and often an uncontrolled intervention, in the lives of others;*
- b) *case-study research provides a biased view, a distorted picture of the way things are;*
- c) *case-study research is essentially conservative,*
(Walker, 1983, p156).

More recently ethical issues raised by this type of research have been discussed. For instance, Miles and Huberman (1994) in their latest book have devoted a whole chapter to 'Ethical Issues in Analysis' (ibid pp.288-297). They identify a series of issues that typically need attention before, during and after qualitative studies. They list them in the order they arise during the research process. They are: worthiness of the project; competence boundaries; informed consent; benefits, costs and reciprocity; harm and risk; honesty and truth; privacy, confidentiality and anonymity; intervention and advocacy; research integrity and quality; ownership of data and conclusions; use and misuse of results; and conflicts, dilemmas and trade-offs (ibid. pp.290-296). Burgess (1989) spoke of four broad ethical dilemmas faced by educational researchers. These were research sponsorship, not relevant in my work; research relations between the researcher and the researched, raise questions of access, power, harm, deception, secrecy and confidentiality; informed consent, referring to the voluntary consent of the individual to participate in research; data dissemination, about confidentiality, the extent to which data can

be reported back and the extent to which research reports can be used by policy makers and in educational practice, (Burgess, 1989, pp5-6). I will consider these issues where relevant to my research later in this chapter.

A new development in the case study approach has been that of multi-site case studies or cross-case analysis. 'There are signs that this is becoming an increasingly popular research design in policy and organisational research,' (Bryman and Burgess, 1994, p.223). 'It is probable that further exploration and developments will take place in this area of data collection and analysis as qualitative researchers move away from the classic 'one-shot' case study,' (ibid p.224).

'One aim of studying multiple cases is to increase generalizability, reassuring yourself that the events and processes in one well-described setting are not wholly idiosyncratic. At a deeper level, the aim is to see processes and outcomes across many cases, to understand how they are qualified by local conditions and thus to develop more sophisticated descriptions and more powerful explanations,' (Miles and Huberman, 1994, p172).

'Multiple cases also help the researcher find negative cases to strengthen a theory, built through examination of similarities and differences across cases. That process..... is much quicker and easier with multiple cases than with a single case. Multiple cases not only pin down the specific conditions under which a finding will occur but also help us form the more general categories of how those conditions may be related,' (ibid. p.173).

This was the research strategy I adopted. Case study was chosen for all the reasons rehearsed earlier in this chapter but in a nutshell because I hoped this approach would add extra in-depth insights to an understanding of the complexities of the curriculum change process. I used the multi-site variation on an individual case study since I was keen to identify common structures, environments and processes underpinning change. Such cross-case analysis it seemed to me offered the strengths (in depth) of one-shot studies allied to the breadth offered by studying multiple cases. I wanted to avoid the danger of the potentially idiosyncratic single case study and sought the reassurance of commonalities.

To return to the practical methodical issues of case study research mentioned earlier in the chapter I shall now discuss each in turn. The first issue was that of increasingly difficult access to subjects for research. Having identified three

local education authorities (LEA's) for study (see chapter 5) I made informal contact with advisers responsible for geography, first to determine their willingness and the likely willingness of their teachers to be involved. Having ascertained that, I wrote formally to the respective Directors of Education (fig. 5.1) seeking permission to approach individual schools. Once that permission had been gained I sought the advice of each LEA adviser as to which school to contact. Those proposed were in the view of the advisers amongst the more dynamic and effective departments in the LEA and were likely to be prepared to help with the research. Particularly helpful in gaining access to specific schools was a letter and questionnaire sent out by each LEA adviser (figs. 5.2 and 5.3) to each department. This probably increased the credibility of my research in the eyes of heads of department. The next stage in gaining access to the department and particularly the head of department for interview was a letter and follow up telephone call to arrange the interview.

In my case then access to the 'subjects' (heads of department) was relatively unproblematic for a variety of reasons. These included official validation of the research by Directors of Education and LEA advisers and that I knew two of the advisers through past professional contact. Nowadays such access would be more likely to be obtained via the headteacher than through a relatively less powerful LEA. To an extent access to departments was made easier by myself coming from the Institute of Education University of London with a positive reputation for geography education. Similarly inevitably I knew some of the heads of department or they had attended courses at the Institute. All of this probably helped in gaining access.

The critique that case study only results in 'partial' portraits of instances is valid and unless a case study was to be hugely detailed and longitudinal, cannot be countered. In my case the picture painted was from the departmental and head of department perspective and unashamedly so, since this 'level' in the school system was considered vital in the change process. On the other hand the perspectives of the other teachers, students and heads were not gained.

The subjectivity and, perhaps, bias of the researcher again is difficult to dispute. At least consciously I attempted to make the interviews and subsequent data analysis 'objective' by allowing the interviewee and data respectively to determine the process. In other words the interviews were broadly structured around themes but the interviewee was encouraged to answer in a personal way. Furthermore it was not my choice to sample those departments. I relied on the advisers' advice. As to data processing, my

'portraits' and 'themes' were grounded in the data. I did however, allow myself the luxury of commenting on every interview, on tape, after completing each interview. Subconsciously however one is inevitably subjective in the entire research process. It cannot be avoided. Borg reminded me of some of the problems of bias in the interviewing procedure which was my major source of data;

'Eagerness of the respondent to please the interviewer, a vague antagonism that sometimes arises between interviewer and respondent, or the tendency of the interviewer to seek out the answers that support his (sic) preconceived notions are but a few of the factors that may contribute to the biasing of data obtained from the interview. These factors are called response effect by survey researchers,' (Borg, 1981, p.87.)

As to the issue of reliability I gave every interview the same format and structure. However the location, time of day, state of mind of the interviewee and other factors could not be replicated on another occasion because of the uniqueness of the 'event'.

Was the research approach undertaken valid for the question being answered? I think the answer is a qualified 'yes' in that innovation processes were focused on throughout the interviews but from a 'partial' perspective, that is from that of department head and department. Another view on case study validity is expressed by Bassey. He considers that if case studies

'are carried out systematically and critically; if they are aimed at the improvement of education, if they are relatable, and if by publication of the findings, they extend the boundaries of existing knowledge, then they are valid forms of educational research,' (Bassey, 1981, p.86.).

Observer influence is a little more tricky since it is impossible to say what influence one did have. Suffice to say that I resisted wherever possible indications of my own feelings, interest and knowledge of CAL geography and particularly resisted invitations to lead sessions on the same. Clearly some teachers saw me as an 'expert' in CAL geography and in addition coming from the Institute of Education may have tried to respond in the way they imagined I wanted them to respond. However the detailed nature of our conversations, in my view, revealed very quickly if statements were rhetoric or reality.

The most common critique of the case study approach is the temptation and therefore danger of generalising from the cases studied. Because I engaged

in multi-site case studies involving study of transcriptions of interviews with teachers (15 in all) and advisers (9 in all) I was able to identify common threads which study of a single instance would have not allowed. What it did do was to identify processes, actors and environments which offer insights worthy of applying to other instances in other situations and thereby adding to a deeper understanding of the change process.

A number of ethical concerns were raised by this research. In retrospect I worry that some interviewees were faced with an interview with a perceived 'expert' from a well known and respected university and that this was 'foisted' on them by a 'powerful' adviser. The interviewer was in a position of power and the interviewee was powerless and could have felt threatened. I made every effort on a personal level to make this a meeting of same status professionals but I cannot be sure how I was perceived. I very much took the stance that they were the 'expert practitioners' and I sought and valued their views. I did!

To an extent I was guilty of not being entirely open about the focus of the research. It was put to them that I was interested in CAL geography in schools in a broad sense. In fact I was particularly focused on the positive and negative influences, actors and environments affecting change. What I did do is ensure total confidentiality throughout the research process by changing the names of all interviewees and making schools and LEAs anonymous. I asked permission to write up the research in my own way and ensured anonymity in a letter sent to all interviewees (fig. 5.5) which they had to sign and return. In this way I am convinced that interviewees, schools and LEAs that could be perceived negatively by readers of this research cannot be identified. I am the only one that can do so. That is not to say that some insiders within a school or LEA might not be able to identify themselves or colleagues. However the time we are now from these events and circumstances should make that unlikely. Overall I feel that through 'informed consent' (Burgess, 1989, p.6) and the way I conducted interviews and wrote up the research, I have not in any way harmed the participants in the research which is the key ethical concern for educational researchers.

I have diagrammatically illustrated my research sequence in fig 3.6. Presented like this it appears totally linear, chronological and sequential. As I discussed earlier it was not like this since its inevitable 'messiness' caused several stages of the research to overlap. For instance the literature review was conducted throughout the research period. To an extent some of the mechanics of the

Fig 3.6 The Research Sequence

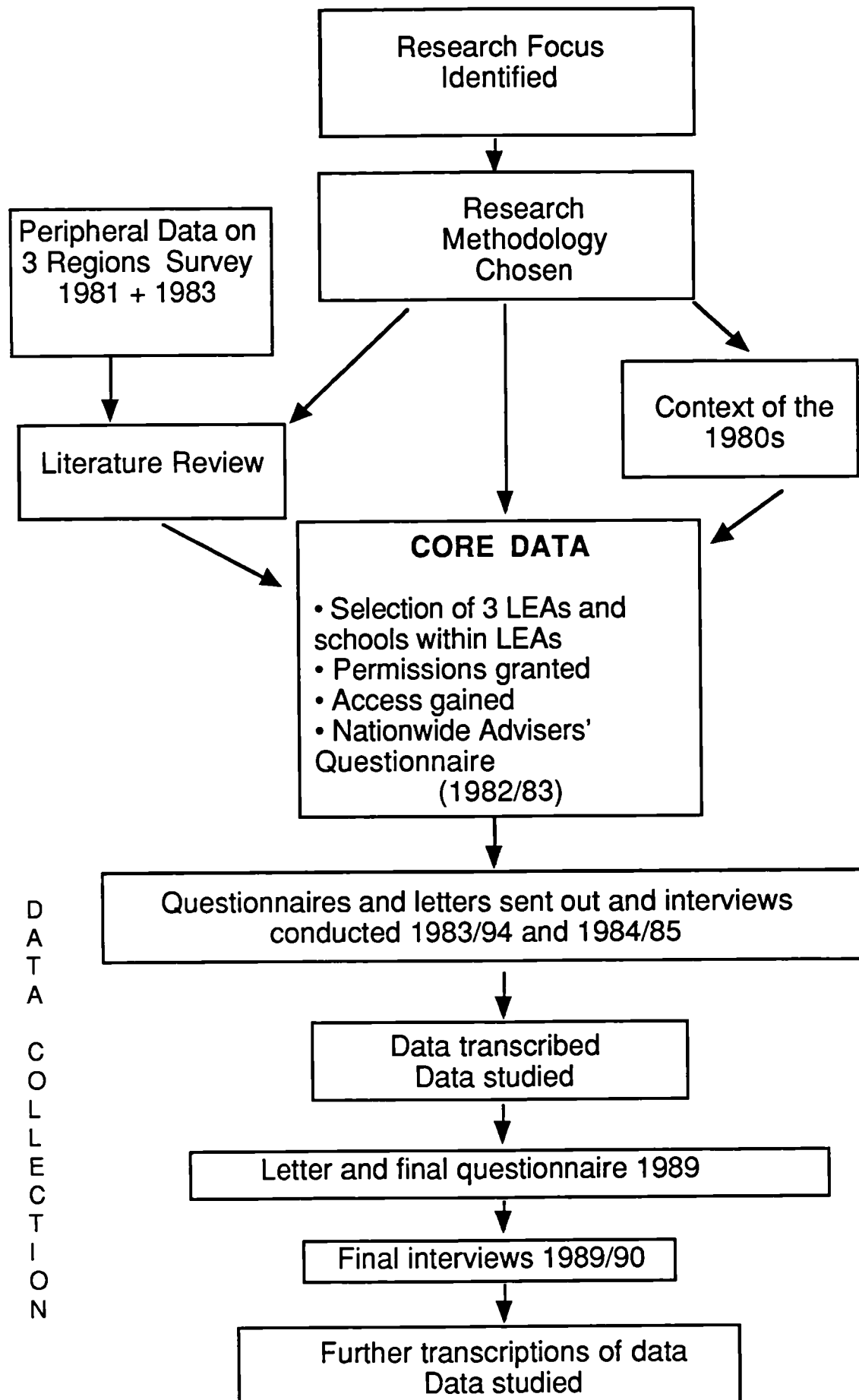


Fig 3.6 (continued)

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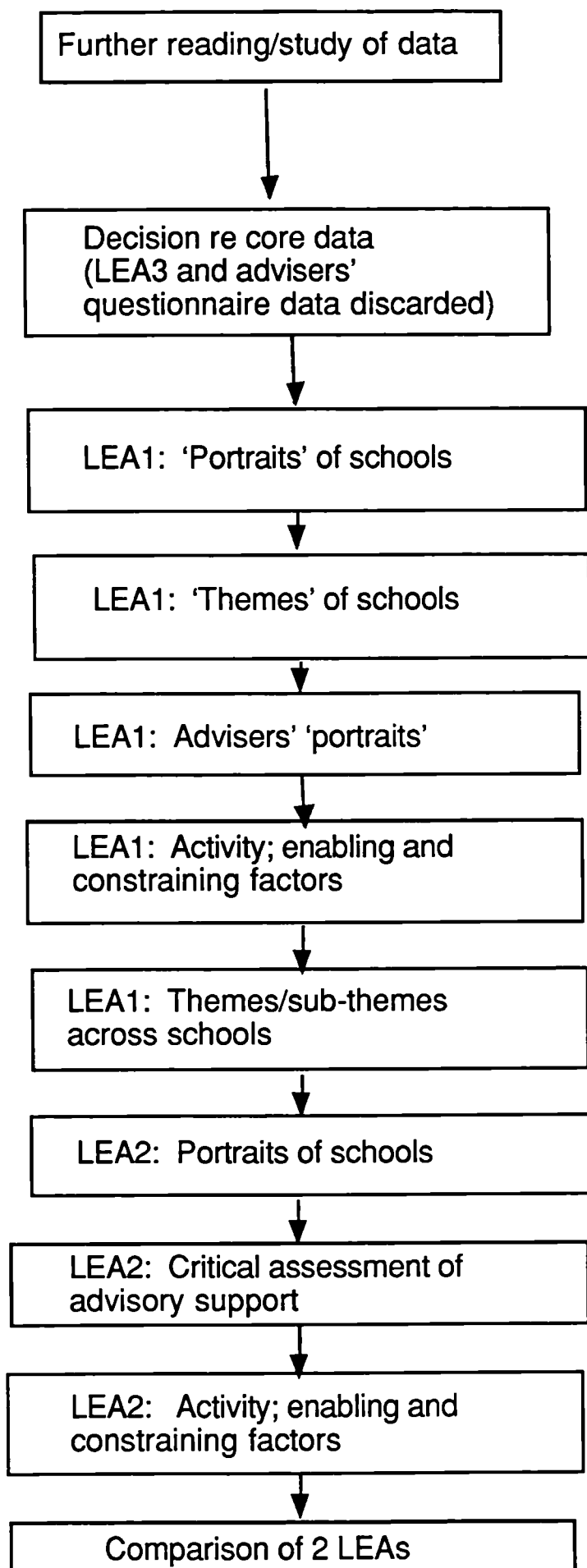
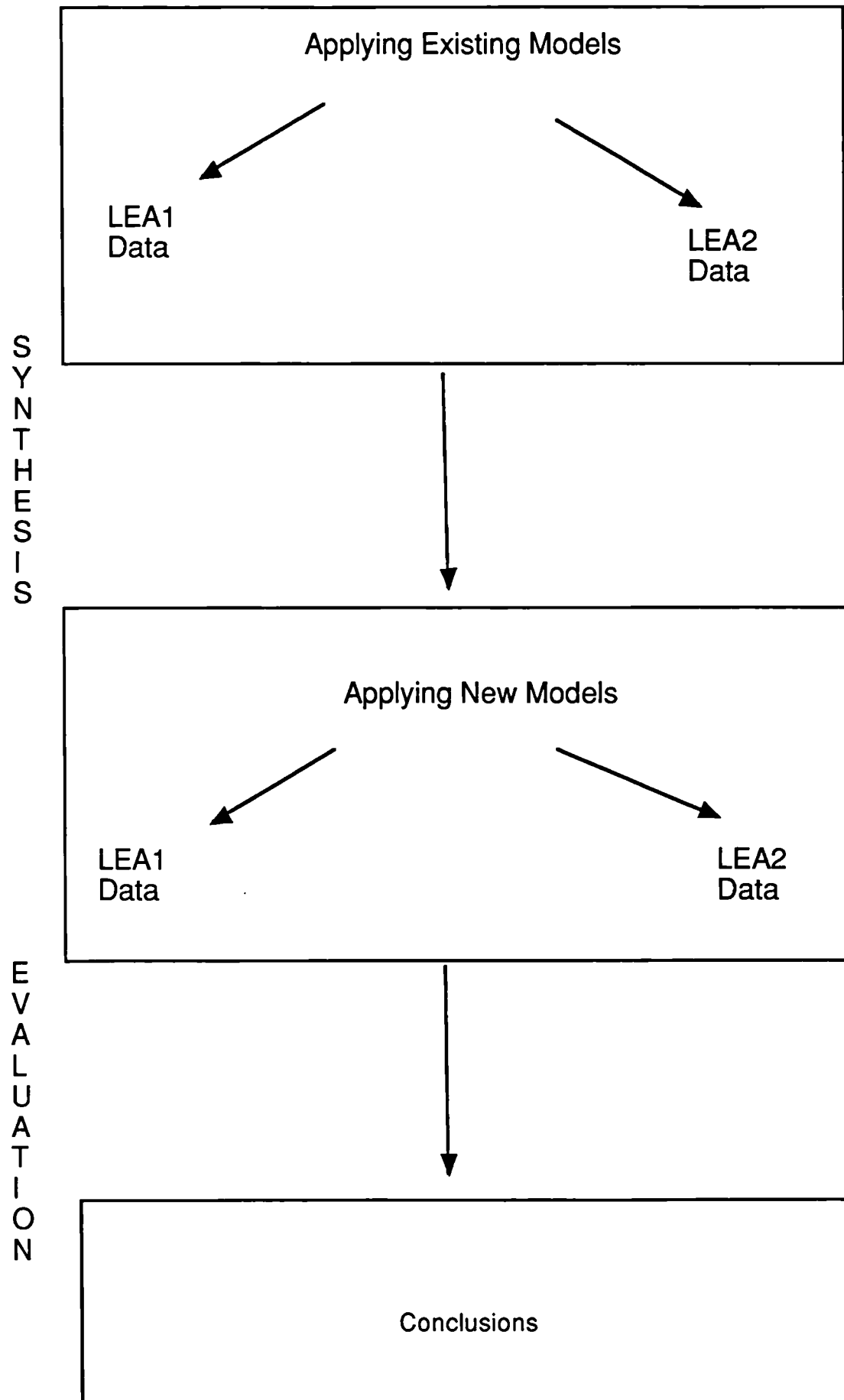


Fig 3.6 (continued)



research are discussed in chapter 5 and earlier in this chapter so I will focus here on only the elements not yet mentioned.

The literature review has been discussed in chapter 2 and the wider context of the nineteen eighties is described in chapter 4. There were initially two elements to the 'core' data of this research, firstly the interview data with heads of geography and advisers in the three LEAs and secondly a national questionnaire survey of LEA advisers with responsibility for geography and implemented in 1982 and 1983. Related yet peripheral data informing part of chapter 4 was the regional survey of CAL geography undertaken with Hall and Wiegand (Hall et al, 1982, 1985).

Once interviews had been organised I had to determine the type of interviewing to undertake. Yet before that I had to consider the principles and practice of interviewing. A good deal of help on interviewing exists in the literature. For instance some books focus on interviewing alone, such as Powney and Watts (1987) and Wragg (1981). Others have sections on interviewing such as chapter 13 in Cohen and Manion (1985); section four 'Conversations in Field Research' in Burgess (1982); and chapter 9 by Wiegand in Williams (1996).

The interview has been described as 'a conversation between interviewer and respondent with the purpose of eliciting certain information from the respondent' (Moser and Kalton, 1971, p.271), or as a means of 'collecting talk', (Powney and Watts, 1987).

The advantages of interviews are that they 'can yield rich material and can often put flesh on the bones of the questionnaire responses,' (Bell, 1993, p.91). It allows for greater depth than is the case with other methods of data collection, is personalised to the interviewee, gives opportunities for probing and asking, gets a good rate of return, and usually exhibits a fair degree of reliability.

On the other hand it is an approach that is open to bias, its validity can be questioned, and can be enormously time consuming not least before and after the event. For instance seeking access and permission, travelling, transcribing and analysing are very expensive of time. Cannell and Kahn (1968) suggest that three conditions are necessary for a successful interview. Firstly the information required must be accessible to the interviewer. Secondly the respondent must understand what is required and thirdly the interviewee must want to cooperate with the interviewer and answer accurately and truthfully.

Most of the literature speaks of a continuum between tightly and loosely structured interviews. Grebenik and Moser (1962, p.16) speak of a 'continuum of formality' between a completely formalised interview with the interviewer behaving as much like a machine as possible and a completely informal interview in which the shape is determined by individual respondents. My approach was somewhere between the two extremes whereby a framework of topics was established beforehand but considerable freedom of response was given to the respondent. The broad structure enhanced reliability and made the analysis of the data a touch simpler.

With all this advice in mind I organised the first set of interviews for 1983/4. Most interviews were conducted in the relative peace of a departmental office and during free periods or at the end of the school day. In some cases it was more convenient for the respondents for me to visit their homes. Before the interview I repeated its purpose and the promise of confidentiality and sought permission to use a tape recorder. This was only denied on one occasion when I took notes in long hand. I used a framework of points as the structure of the interview (fig, 5.4). I found that having the completed questionnaire at hand was useful for clarification of points. To an extent framework points 1 and 2 on the school and geography department and computing generally were more 'objective' and easy for the respondent to answer. These items helped to break the ice in the interview and by the time point 3 came along, that is geography and computing, the interviewee was often loquacious!

Interviews took in general 45-60 minutes but in some cases longer. The 1984/5 and 1989 interviews were much shorter since they could focus on changes since the last interview.

Having undertaken this core data collection and transcribed it, I was faced with the challenge of analysing it. Although, as mentioned earlier, there has been an increase in volumes discussing qualitative research there have been relatively few that concentrate on data analysis. Possibly best known of the latter type are Miles and Huberman (1994), Bryman and Burgess (1994), Bliss, Monk and Ogborn (1983) and Strauss and Corbin (1990).

Bryman and Burgess helpfully identify two general strategies for the analysis of qualitative data. These are analytical induction and grounded theory, (Bryman and Burgess, 1994, p.4). Analytical induction involves developing hypotheses from careful study of data and then further data is collected against which these

hypotheses are matched. If there is a lack of fit the hypotheses will need reformulating and so the process goes on until, 'cases that are inconsistent with what ends up as the last reformulated hypothesis do not appear', (ibid p.4). Clearly it is a highly demanding process, which could explain its infrequent use.

The other general strategy is grounded theory. 'This methodology differs from other traditions in that theories are grounded in data generated through the research act and not developed before or after data analysis,' (Tilbury and Walford, 1996). The process is clearly described by Bryman and Burgess:

'After some data collection and reflection in relation to a general issue of concern, the researcher generates 'categories' which fit the data. Further research is undertaken until the categories are 'saturated', that is, the researcher feels assured about their meaning and importance. The researcher then attempts to formulate more general (and possibly more abstract) expressions of these categories, which will then be capable of embracing a wider range of objects. This stage may spur the researcher to further theoretical reflection and in particular he or she should by now be concerned with the interconnections among the categories involved and their generality. Hypotheses about links between categories will need to be reformulated and tested in the field. Links with other theoretical schemes are then explored and as further revisions of hypotheses are carried out, as a result of both data collection and theoretical reflection, the emerging theory is tested once again in the field,' (Bryman and Burgess, 1994, p.4).

In grounded theory, variables or categories emerge in the process of the research and a primary goal is to identify the core variable which forms the basis of the theory. 'Always underlying any grounded theory study is the question of how to capture and make sense of the complex phenomena under study,' (Tilbury and Walford, 1996, p.55). Coding is a key step in the grounded theory strategy. It is about categorising and sorting data with the 'codes' providing the link between data and conceptualisation which is the next stage in the process. Initial coding is seen as 'the process of breaking down, examining, comparing, conceptualising and categorising data', (Strauss and Corbin, 1990, p.61). Later, axial coding is used which involves 'a set of procedures whereby data are put back together in new ways after open coding, by making connections between categories', (ibid, p.96). My research described in these terms, adopts the grounded theory strategy rather than that of analytical induction.

Two key processes are identified in the literature as later stages in the operationalisation of grounded theory. They are the generation of concepts and the building of typologies and taxonomies. I was certainly engaged in both in the process of this research.

Various issues arise from the use of qualitative data analysis. Bryman and Burgess (1994) reflect on these in their last chapter (*ibid*, pp.216-224). In particular they debate the often voluminous, unstructured and unwieldy data generated by qualitative research and how to cope with it; they question whether grounded theory generation regularly happens; and they acknowledge the progress made in developing methods of data collection but suggest that 'the challenge for qualitative researchers in the next decade is to articulate as fully as possible the processes associated with data analysis,' (*ibid*. p.224).

Informed by these strategies and processes of qualitative data analysis I confronted my own data. Reading and rereading my interview data I quickly came to two conclusions. Firstly there was too much data with which to cope and secondly there were clear and identifiable differences between data associated with each LEA. LEA 1 stood out, through the data, as a set of cases where there were relatively high levels of activity and a number of facilitating 'actors' and 'environments'. At the other extreme were the cases from LEA 2. Cases from LEA 3 were between the two. I made the strategic decision that I should focus analysis on LEA 1 as the set of cases where there was relatively more activity and make that my 'core' data. I could then study the detail of the processes facilitating such activity. As additional yet peripheral data I chose to focus on LEA 2 as the extreme. Having developed coding and concepts for LEA 1 data I could apply those to LEA 2 data and both test the coding and conceptualisation and identify the uniquenesses of LEA 2. This removed the quite unrealistic burden of attempting to analyse all the data collected. At the same time I decided to dispense with the nationwide LEA advisers questionnaire survey data collected for 1982 and 1983 because of the disappointing response rate. Some mention of that survey is made at the end of chapter 4.

After re-reading the transcript I moved to initial coding of the data. This led to the isolation of six categories around which I painted a 'portrait' for each 'case'. These categories were: background (about the school); interviewee; geography department; the school; the LEA; and national picture. Details of these are given in chapter 5. To build these portraits I reworked the transcription for each case also taking into account the questionnaire data for each case. These

detailed portraits are shown in appendices 5.3 to 5.9. Each portrait is in prose and has a section on the 1983/4 and 1984/5 situations and, if appropriate, the situation in 1989/90. I liberally used direct quotes from the interviewee throughout each portrait and at the end made some brief subjective comments and interpretations.

I then carefully studied the seven detailed portraits pondering how to take the analysis further. This led me to the 'axial coding' stage which it seemed to me was analogous to the 'pattern coding' discussed by Miles and Huberman (1994).

'Pattern coding is a way of grouping those summaries into smaller number of sets, themes, or constructs..... pattern coding has four important functions:

- 1. It reduces large amounts of data into a smaller number of analytic units*
- 2. It gets the researcher into analysis during data collection, so that later fieldwork can be more focused*
- 3. It helps the researcher elaborate a cognitive map, an evolving more integrated schema for understanding local incidents and interactions*
- 4. For multicase studies, it lays the groundwork for cross-case analysis by surfacing common themes and directional processes,'*
(ibid, p.69).

This neatly summarises the coding I engaged in.

Reading the portraits led me to identify four environments and one actor of key significance in this change process. In order I called these five 'domains': the school context, the departmental context; the head of department; the environment within the school for IT and geography; and influences from beyond the school. These domains and detailed sub- categories are shown in fig. 5.13.

To do this I used file cards for each of the sub categories, eighteen in all. For each case (ie interviewee) I studied the appropriate portrait and made observations in note form under each of the sub categories. I labelled each note made as to which interviewee it related to and at the same time for each interviewee I used a different coloured pen to be sure that I kept each of the seven observations distinct. Themes 1 to 5 are shown in appendices 5.12 - 5.16.

I then studied the transcripts of my interviews with Tom David and Paul Gomer and identified four headings as the basis for structuring portraits of them. (Appendices 5.10 and 5.1) Subsequent study of these portraits led me to identify common elements across them.

Having now for LEA 1 a range of seven school portraits and a set of five themes along with the analysis of portraits for the two advisers, I then sought to generalise across the cases as is possible in a cross-case analysis. Under the headings activity; enabling factors; and constraining factors I used all this processed data. I then reworked and refined the theme data (appendices 5.12 - 5.16) by taking each of the eighteen sub themes and identifying common and distinctive features drawn from across the schools. This I have written up in chapter 5.

For the three cases in LEA 2 I developed portraits as shown in appendices 7.1 - 7.3 based upon the original interview transcripts. I was then able to directly consider levels of activity together with enabling and constraining factors across the three cases. Finally I critically assessed advisory support in LEA 2 directly based on study of the transcripts with advisory staff. The level of processing of this data was not, purposely, as great as for LEA 1. I then undertook a comparison of the two LEAs.

The next stage in the research process is shown in fig. 3.6. As explained in chapter 6, I applied existing models to the data for LEA 1 and LEA 2 and then developed my own models and assessed their 'fit' to the data. The final stage in the study was an effort to draw together the conclusions and perspectives gained from this multi-site case study research.

Before considering the data in chapters 5, 6 and 7, in the next chapter I address the educational and IT environments of the nineteen eighties.

Chapter 4

The Wider Context of the 1980s

The Educational Environment

The nineteen eighties were an unhappy period for education and educators. Sir Keith Joseph was Secretary of State for Education between September 1981 and June 1986 and 'it proved to be a disastrous period for education, culminating in a crisis almost reaching the proportions of a Greek tragedy', Simon (1991, p. 488).

A unifying thread throughout this period was an increased centralisation of power and reduction of the power of LEAs. Innovations such as the setting up of the Technical and Vocational Educational Initiative by the Manpower Services Commission and the Education Support Grant System all had such an effect. In April 1982 the Schools Council was abolished and in June 1983 a conservative government was re-elected for a second period.

An NOP poll conducted for the Times Educational Supplement (TES) gave a clear picture of how teachers felt in 1984, at the heart of my data collection period. 757 primary and secondary teachers in maintained and independent schools in England and Wales were personally interviewed between May 14th and July 18th 1984. The findings were reported in the TES on 21/9/84 under the banner headline of 'Pay-obsessed staff feel public esteem has hit a new low'. As was reported by Biddy Passmore on page 14 this 'shows strong signs of a beleaguered profession virtually obsessed with pay' (ibid). 89% of those surveyed disagreed that 'teachers are held in higher public esteem than 10 years ago.' 92% disagreed that 'the teaching profession offers job satisfaction and security and it is right that the level of pay should be lower than for less secure jobs'.

June 1984 saw the announcement of a new examination, the GCSE, for 16 year olds with differentiated papers and questions in every subject. By January, 1985 there began a 'programme of action' related to appraisal, teacher management and training. This re-emphasised the government's view that performance related pay was of critical importance. This continued to be a major focus for dispute with the teacher unions.

Jackson Hall did not find it surprising therefore

'that the centralist tendency has forfeited the co-operation and goodwill of the service on which everything depends disillusion and pessimism are rampant throughout the service', (Hall, 1985).

Later in the year Judge remarked in a similar vein that,

'the morale and confidence of the education service is now at a desperately low point why? at the root of the trouble an assault upon autonomy and an attempt to accumulate all effective power in the hands of an aggressive central government', (Judge, TES, 11/10/85).

Also in 1985 Prime Minister Thatcher had been rejected for an honorary degree by Oxford University. The teachers' action (1985-87) was the 'longest and most damaging confrontation between teachers and the state ever yet experienced', Simon, 12/9/91 p.512). The action was also to do with a deep concern over pay and conditions of work and essentially began in February 1985 when the NUT started its 'withdrawal of goodwill' actions to support a pay claim.

Sir Keith Joseph resigned in May 1986.

'Education will never be the same again after Keith Joseph. Morale among school teachers and academics is at rock bottom and that may count as the most important failure of Sir Keith Joseph's reign', (Izbicki, Daily Telegraph 22/5/86).

Kenneth Baker took over as Secretary of State and soon gained more resources for education. By 1987 he had first mooted suggestions of a National Curriculum. In 1988 the Education Reform Act was passed and by July 1989, Baker left education to become chairman of the Conservative Party. His position as Secretary of State for Education was taken by John MacGregor. However the major influence on the educational environment of my study period was that of Sir Keith Joseph and as can be seen it was not a period conducive to encouraging curriculum change!

The IT Environment

Prior to the 1980s

Various government organisations have been concerned with educational technology since the late 1960s. The National Council for Educational Technology was first formed in 1967 and renamed as the Council for

Educational Technology (CET) in 1973. CET was funded directly through the government's education departments and its remit covered all aspects of education and training in the UK. It offered a focal point for the collection of information and advice on all matters affecting or affected by educational technology.

By 1969 a feasibility study on 'Potential applications and development of computer - based learning systems' recommended to the DES that a national development programme in computer assisted learning (NDPCAL) should be set up. This was done in 1972. Its emphasis was on development activities leading to continuity of use beyond the period when central funding was involved. It had two main focuses: first on the use of computer technology in the management of education and its institutions and secondly as a medium of teaching and learning in a range of subject areas.

During 1972-7 it supported a range of projects including Computer Assisted Learning in Upper School Geography (CALUSG) and the Geographical Association Package Exchange (GAPE). Both were set up to develop and disseminate CAL materials in geography.

At a similar time there were independent organisations working on the use of computers in schools. These included the Educational Computing Section of Chelsea College, University of London; the Advisory Unit for Computer Based Education at Hatfield; ITMA (Investigations on Teaching with Microcomputers as an Aid) based principally at the College of St. Mark and St. John, Plymouth and the Shell Centre for Mathematical Education, Nottingham University; and MUSE, the national body for co-ordinating activity in schools, colleges of education and other institutions with an interest in using computers in primary or secondary education.

The 1980s: a Decade of Central Initiatives

'The scale of investment in the microcomputer during the 1980s in the UK has been on a level which no other item of educational technology has ever equalled or is ever likely to match', (Wellington, 1990, p. 57). As the Times Educational Supplement put it, it was a 'boom decade' (17.3.89). As pointed out in chapter two, Kenneth Baker became the Minister for Information Technology and in 1981 launched the Micros in Schools scheme claiming that 'kids of today' urgently needed modern, up to date skills, analogous to the skills that had gained their ancestors employment:

"... I want to try and ensure that the kids of today are trained with the skills that gave their fathers and grandfathers jobs and that is the reason why we have pushed ahead with computers in schools. I want youngsters, boys and girls leaving school at sixteen, to actually be able to operate a computer,' (Baker, 1981)

Fig 4.1 indicates that this rhetoric was matched by funding through the 1980's. In 1980 the DES funded the Microelectronics Educational Programme (MEP) with a brief to encourage the development of curriculum materials utilising new information technologies (NIT) to establish a system for the dissemination of information and to provide for in-service teacher training.

In 1981 The Department of Trade and Industry (DTI) began to prepare a 'Micros in Schools' scheme. This offered half the cost of a microcomputer to every secondary school. In 1982 this scheme was extended to primary schools.

The Department of Employment began funding the Technical and Vocational Education Initiative (TVEI) in 1983. This worked with schools through the Local Education Authorities to enhance the provision of NIT, to train teachers in its use, and to initiate curriculum and materials development.

In 1983 the Equal Opportunities Commission (EOC) funded a report on gender issues relating to NIT. This report found that whilst IT encompassed both traditionally masculine fields (such as electronic engineering) and feminine fields (such as typing) it would affect the working lives of all pupils and recommended that the IT curriculum be widened from one in which the computer was the focus, studied principally by boys, to one which looked at the applications of computers in society which might encourage more pupils to use computers with confidence and competence.

In 1985 the DTI supported a scheme to subsidise the purchase of educational software by LEAs.

In 1986, following the completion of the MEP, the Microelectronics Educational Support Unit (MESU) was established. It had the brief to consolidate the success of the MEP by working closely with LEAs and initial teacher training establishments to support the integration of IT in the curriculum. In the same year, the DTI funded a scheme to place modems in schools. It also supported a national scheme to establish a database about the application of NIT to

FIGURE 4.1

GOVERNMENT INITIATIVES IN THE 1980s

			Approximate cost (£ million)
1980-6	DES	Microelectronics Education Programme	23.0
1981	TeCs	Information Technology Centres	Not Known
1981-2	DTI	Micros in Schools scheme	15.1
1982-4	DTI	Micros in Primary schools	9.5
1983-4	DTI	Secondary schools extension	2.1
1983-95	DoE	TVEI	920.0
1985-8	DTI	Support for Educational Software	3.5
1986	DTI	Modems in schools	1.0
1986-8	DES	Microelectronics Education Support Unit	7.0
1986-9	DTI	NERIS	3.0
1987	DTI	IT equipment in schools	3.5
1987-90	DENI	Vocational Education Programme	18.0
1987-93	DES	IT in Schools Strategy	90.0
1988-date	DES	National Council for Educational Technology	Not Known

education and NERIS (National Educational Resources Information Service). This was later supported by the DES and the Welsh Office (WOED).

In 1987 the DES provided further assistance to LEAs to provide training for teachers through an advisory teachers scheme and to purchase equipment. A condition was that the LEA had to provide a detailed five-year plan of its support of NIT in schools.

In 1988 the long established CET was merged with MESU to form the National Council for Educational Technology (NCET).

Micros in Schools Scheme

The Micros in Schools Scheme was launched in 1981, 'With the objective of encouraging the widespread use of computers in teaching and learning'. Commonly known as the pound for pound scheme, it came into operation on 1st June 1981 so that by the end of 1982 all secondary schools in the UK would have a microcomputer. Schools had the choice of two microcomputers, the RML 380Z and the BBC model A. Over 6500 schools took up this offer and a subsequent programme was initiated for primary schools as well as extensions of the original support scheme for secondary schools. Margaret Thatcher, the prime minister, launched the original scheme with a forward to the booklet outlining it.

'Britain's greatest natural asset has always been the inventive genius of our people. This is the asset which we must tap if we are to profit from advances in technology. In microelectronics and Information Technology, we must do everything to encourage and train people with the ability and skills needed to design systems, write software and develop new businesses and products. We must start in our schools. The microcomputer is the basic tool of Information Technology. The sooner children become familiar with its enormous potential the better. At present only some schools have microcomputers. That is why the Department of Industry has introduced its "Micros in Schools" scheme. This scheme, closely linked with the Education Departments' Microelectronics in Education Programme, is the first in a series of initiatives which the Government is taking to ensure that Britain stays with the leaders in the rapidly growing Information Technology market. I urge schools and Local Education Authorities to take advantage of the Department of Industry scheme. I hope that schools who are willing to do so

will be supported by their parent/teacher associations." Micros in Schools Scheme, DOI (1981).

Microelectronics Education Programme

The Microelectronics in Education Programme (MEP) was originally scheduled to run from 1981-1984 but was extended to 1986. The aim of the Programme was to 'prepare children for life in a society in which devices and systems based on microelectronics are commonplace and pervasive'.

In developing a strategy for the Programme, it was stated that:

- i Schools should be encouraged to respond to these changes by amending the content and approach of individual subjects in the curriculum and, in some cases, developing new topics.
- ii With the dual aim of enriching the study of individual subjects and of familiarising pupils with the use of the microcomputer itself, methods of teaching and learning should make use of the microcomputer and other equipment using microprocessors. This may be expected to add new and rewarding dimensions to the relationship between teacher and class or teacher and pupil.
- iii Use should be made of the microcomputer to develop the individual pupil's capacity for independent learning and information retrieval.
- iv For those children with physical handicaps, new devices should be used to help them to adjust to their environment while those with mental handicaps should be encouraged and supported by computer programs and other learning systems which make use of new technologies.

The Programme was to cover the application of microelectronics in schools and non-vocational courses for 16-19 year- olds in further education (FE); in practice its main focus was to be on secondary schools, and on fostering links between schools, FE and industry. Priority was to be given to applications in mathematics, the sciences, craft, design and technology, geography and courses related to business or commercial occupations. Some attention was also to be given to careers education, language and the humanities and to the needs of pupils with learning difficulties in remedial and special education. Some new areas of study were also identified as themes to be addressed within school and college subjects.

To attain its aim the Programme identified three main groups of activities which it needed to promote:

- Curriculum Development: this would involve the commissioning and, where necessary, production of teaching and learning materials for existing subjects and courses as well as new disciplines. Some curriculum development projects would be promoted by the MEP in conjunction with existing national software development groups while others would be run by the MEP's new regional organisations and still others would be funded to take place in individual schools and IT user groups.
- Teacher Training: this would involve building on existing course provision after the identification of teachers' training needs. It was acknowledged that the role of the LEAs was crucial in this activity and that the MEP would act mainly as a catalyst and facilitator, working in partnership with them. It was proposed that a function of the regional centres would be to evaluate teaching materials and methods and to promote the in-service training of both teachers and trainers. Some courses designed for 'self-tuition' would also be produced, as well as materials that trainers could use in their work. The provision of these courses would be in partnership with LEAs. The content and format of initial teacher education courses were not addressed by the Strategy to the same extent as in-service education, which was seen as the priority. Nevertheless, close contact was to be sought between the MEP-funded regional centres and local institutions of initial teacher education.
- Resource Organisation and Support: here again the programme sought to work with existing organisations, such as LEA advisory services, Science and Technology Regional Organisations (SATROs), and bodies which already provided information for teachers on materials and equipment for classroom use. Fourteen Regional Information Centres (RICs) were the major vehicle for the dissemination of information to schools and LEAs. They were to provide a network whose users could obtain information about materials, software and equipment and where these might be seen, and on developments in teaching materials. These services were to be linked to the in-service work of the RICs. Facilities for those interested in creating, testing and correcting computer software were also to be provided.

Once the outline strategy had been published in April 1981, some flexibility was called for in its interpretation. New priorities were introduced. For example, when the DTI's offer of computers to primary schools was made in 1982 it involved an obligation upon LEAs to provide basic in-service training for two teachers in each primary school. The MEP became the central agency to support this in-service training and, in addition, it was asked to produce a 'starter pack' of materials. New opportunities and extra expectations resulted from the emergence of new microelectronic hardware and the realisation that IT could be of value to teachers of subjects other than those which had been originally identified in the MEP strategy document.

Figs 4.2 and 4.3 outline the Programme and is the first information pamphlet. Figure 4.4 shows the strategy in diagrammatic form.

An evaluation of the MEPs work between 1983 and 1986 was carried out by HMI and published in 1987. Positive features identified were:

- a) the three stranded strategy, encompassing curriculum development, information dissemination and in-service training. This was deemed appropriate;
- b) the co-operative strategy adopted by MEP considerably strengthened the cadre of well-informed teachers and trainers. It prompted curriculum development in this field and also strengthened groups of LEAs to the point where they were able to take on the role of encouraging and supporting IT. In these respects the "pump priming" objective of the programme seems to have been achieved;
- c) MEP staff were often highly creative, committed and hardworking; they frequently showed outstanding ability to "rise to an occasion" and exhibited resilience in the face of difficulties and uncertainties;
- d) the range of materials developed with MEP funding was impressive, and the quality of many of the later items was high. Where schools had an opportunity to use them, their impact on the pupils' learning was generally beneficial;
- e) in the course of the Programme closer links began to be formed between in-service training and curriculum development in IT. This yielded successful training materials, training courses and some good models for classroom work;





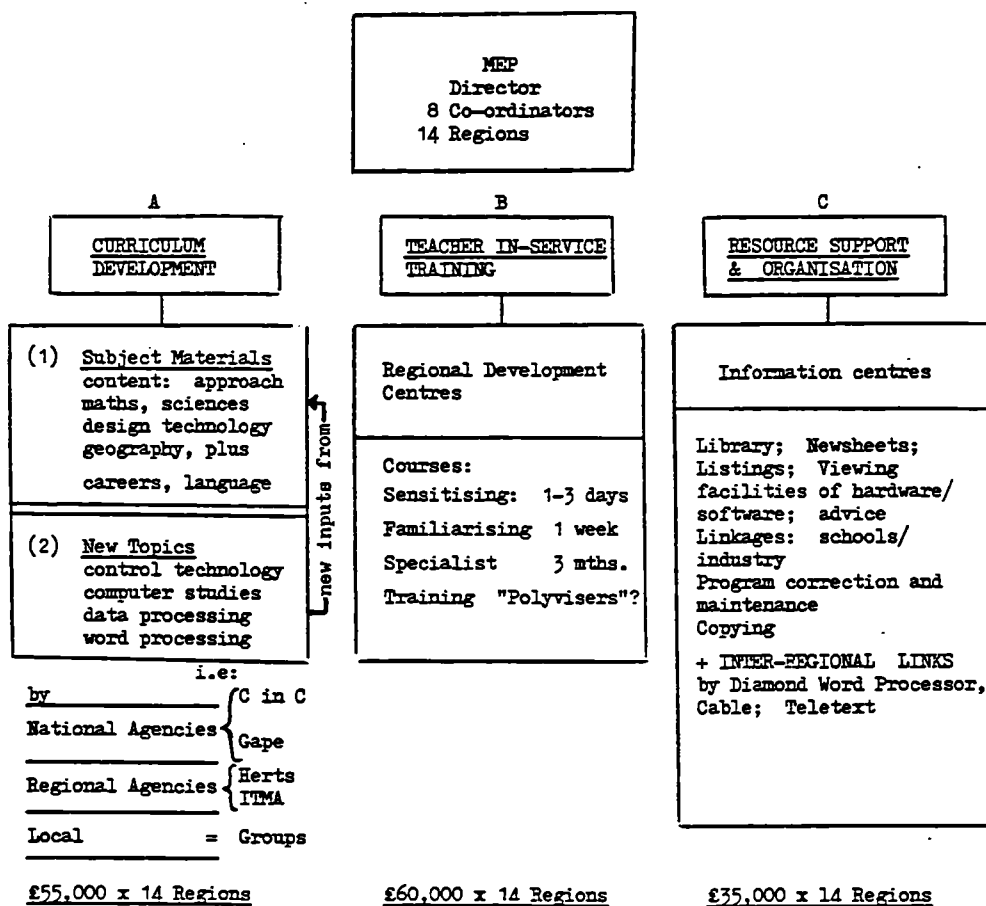


Fig 4.4 Strategy for the MEP Programme: March 1982

- f) MEP-inspired INSET was usually well prepared and, where organised in conjunction with LEAs, more likely to be appropriate to the needs of participants, though not always adequately followed up;
- g) the "cascade" principle of teacher training in IT operated successfully wherever opportunities were offered to trained personnel for sharing their experiences with others. Towards the end of the Programme there was a noticeable increase in the use made of MEP materials in initial teacher training.

The following negative features were identified:

- a) MEP had to work through other agencies; its contact with schools was mainly indirect, and on occasion there were conflicting views between agencies on what schools needed and who should provide it;
- b) there were problems of communication between schools and various agencies seeking to promote microelectronics education. Communications concerning the use of IT were not always easy within schools themselves, especially within secondary schools. Distances to the nearest RIC or SEMERC were an additional hindrance to good and sustained communications. Several RICs were not well informed about the work of the schools in their region;
- c) a better central information service to RICs and other MEP staff at an early stage should have underpinned a national information dissemination strategy, using existing channels of communications rather than relying on new ones. As it turned out, until the last year of the Programme schools were largely unaware of the wide range of resources available to them through MEP;
- d) delay in getting development projects approved and under way was discouraging to proposers and to MEP staff, and slowed the work;
- e) there was some unnecessary duplication of effort in curriculum and materials development and many items were not fully exploited; a lot of products funded by MEP were never developed to the point where they could be satisfactorily used by others not involved in the projects;

- f) MEP liberated ideas and supported enthusiasm and that was right, but it was less effective in building in sufficient checks and balances to assure the quality of outcomes. The limited time allowed for monitoring the progress of many MEP-funded development projects resulted in a lack of close evaluation of such projects and of funded agencies until the last year of the Programme;
- g) leadership of MEP was concerned, creative and enthusiastic, but the organisation as a whole was complex and often lacked clear, corporate purpose.

On the other hand HMI concluded that

'staff morale was low at several points in MEP's history, especially when staff were faced with uncertainties concerning their futures. It is to their credit that such a wealth of new ideas and imaginative approaches to teaching and learning were nurtured and supported during the Programme'. (Ibid, p.46)

As far as LEAs 1 and 2 were concerned the 'face' of MEP, if it had a face, was via the nearest Regional Information Centre (RIC)

To ensure anonymity I shall call LEA 1's RIC, RIC 'A' and LEA 2's RIC, RIC 'B'. They were quite distinctive in approach even though their core activities were designed to:

- a) Provide the point of reference for teachers and others in the region requiring information, software, advice and guidance.
- b) Provide access to MEP products and activities occurring elsewhere in the UK.
- c) Funnel regional initiatives to other teachers across the country.
- d) Implement software standards within the regions.
- e) Co-ordinate curriculum development and evaluation projects.
- f) Liase with local industries.

Students of mine (on an educational computing course) interviewed the two RIC directors in 1984 and I, in addition, have a full set of the respective (i.e. A and B) RIC newsletters. Key distinctions I identified are shown in fig 4.5 and these are based on the interviews and the study of the newsletters. In many ways these two RICs were regarded as two of the most successful and well known nationally. There was close contact between the two directors. They had a strong presence subsequent to the demise of MEP in 1986. Their future existence in both cases, was ensured by providing INSET and developing software.

As far as geography teachers were concerned RIC A had greatest impact through its software which was periodically 'on the road' and provision of some geography courses at its two INSET centres. RIC B had most impact on geography teachers through a lot of centrally provided and located geography courses, development of geography software and a geography working group which produced its own journal. But as I was to discover neither RIC had any direct impact on most geography teachers in LEAs 1 and 2, in spite of all these efforts.

TVEI

In 1982 the government announced an initiative, through the Manpower Services Commission to encourage the provision of technical and vocational education for young people. It became known as TVEI (the Technical and Vocational Education Initiative) and applied to England, Scotland and Wales. The Manpower Services Commission then established pilot projects based on the following terms of reference. Each project would be capable of providing a four-year course, starting at age 14, of full-time technical, vocational and general education, including appropriate work experience, and leading to recognised certification. The project would operate within national guidelines with full local involvement in its running. The purpose of each project and the pilot scheme as a whole would be to explore and test methods of organising, managing and resourcing repeatable programmes of general, technical and vocational education. In March 1983, fourteen projects were chosen, reflecting a range of different strategies.

Within the first year of the initiative a major expansion was announced. The aims established in the first year remained largely in force throughout the project, although the emphasis changed from experimental work to development. A further 48 LEA pilot projects began in 1984 followed by 12 in 1985, 21 in 1986, 11 in 1987 and the remainder in 1988.

Fig 4.5

A Comparison Between Regional Information Centres' (RIC) A and B

RIC A (Serving LEA 1)		RIC B (serving LEA 2)
10 London boroughs both outer and inner London	<u>Constituency</u>	6 London boroughs; 5 shire counties
439 secondary schools	<u>Secondary Schools</u>	470 secondary schools
First published April 1982	<u>Newsletter</u>	First published mid 1981
Most staff full time with constituent LEAs	<u>Staffing</u>	Early appointment of central staff
Major computer centre in Inner London	<u>Major linkages</u>	Strong link with local polytechnic and host LEA where RIC is based.
No great involvement except through management board	<u>Constituent LEAs</u>	Newsheet has sections written by LEAs but LEA2 did not always contribute and dominated by comments about hardware and links with FE+HE
2 centres for INSE in addition to RIC	<u>Major Differences</u>	INSET delivered almost entirely at RIC
Large software/books collection which is 'on road' between 10 LEAs subject at a time. Assistant Director is also information officer which explains this emphasis		Emphasis on approaches to data retrieval
Large centralised software collection listed/reviewed in RIC newsletter		Lot geography courses laid on.
		Host LEA has strong geography teachers IT working group which produces its own journal from mid 1980s onwards
		Geographer on staff of RIC
IT unit based in host LEA existed, flourished after 1986	<u>Life beyond 1986</u>	IT Centre flourished after 1986 and in same location as RIC

Some projects were devised by central LEA groups, others from within individual schools. The LEAs started their work from different baselines. Some were already well resourced and had high quality work in NIT, whereas in others such work was less well established.

The extension of TVEI was announced in 1986 and fundamentally altered the nature of the exercise. LEAs which had completed three years of pilot work could apply to extend the principles of TVEI to all students aged between 14 and 18 in all their schools and colleges. TVEI became a major development project and has to be seen as an important influence on the emerging National Curriculum.

A key feature of the extension phase was that LEAs had to show a clear policy on how to provide studies on technology for all students. NIT alone was not considered sufficient. There was increasing recognition of the multi-disciplinary nature of technology following pioneering work in some LEAs.

NIT in schools benefited most from TVEI in provision of accommodation, equipment, staff and in-service training for teachers. The influence spread beyond TVEI students, and levels of provision were often a bench-mark for non-TVEI schools in an LEA.

Students welcomed the opportunity to develop their competence with new technology. Their motivation was generally high, particularly during individual project work. Word processing was the most common activity across the curriculum, frequently applied to a relevant task such as report writing after work experience. Learning was most effective when staff were confident and aware of how NIT could develop students' capacity to think and plan both independently and collaboratively.

LEA 2 was an early TVEI authority and each of the case study schools studied were early pilot schools. On the other hand none of the schools studied in LEA 1 were TVEI pilot schools. In theory that should have meant greater access for schools in LEA 2 to microcomputing resources (technical support, hardware and software) but interviewees explained that although extra resources, especially micro-labs were provided, access to centrally held hardware became more difficult as demand for it grew.

The Microelectronics Education Support Unit (MESU)

MESU as it soon became known followed on directly from MEP and existed between 1986-8 serving England, Northern Ireland and Wales. The target population of the MESU was well defined. It consisted of those who were directly concerned with enabling change in schools and through whom the MESU might influence the quality of work associated with IT, primarily:

- LEA advisers and advisory teachers in all subjects, aspects and phases of schooling
- staff in institutions providing initial teacher education
- staff in library resources or teachers' centres providing support for teachers in any subject or phase and particularly for teachers of pupils with special needs.

The MESU was not set up to work directly with classroom teachers but to have an influence which would be mediated through the work of other bodies and groups.

The published aims of the MESU assumed a degree of continuity with the work and initiatives of the MEP. The annual grant from the DES was initially about £2.8m covering staffing and administrative costs, all project funding, fellowships and production materials. The initial focus was on a range of phase and subject interests, building on existing foundations with the objective of responding to demand and only occasionally engaging in longer term proactive activity.

Crucial aspects of the work of the MESU were an information service and the encouragement of the formation of networks of expertise between LEAs. Because of its small development budget, the MESU had to limit strictly the range of curriculum development activities in which it engaged. Efforts were made to distribute funds to other agencies in the educational system in partnership schemes and co-operative projects.

The DES IT in Schools Strategy made major additional demands on the MESU's resources. The MESU co-ordinated a nationwide programme of courses to assist in the training of advisory teachers funded through the Education Support Grants. A wide range of materials was produced to support this task.

This was a formidable task. In-service training programmes had to be arranged for over 600 advisory teachers from widely differing professional backgrounds and expertise. They possessed varied capabilities in the uses of IT and were employed on a variety of fixed-term contracts. More than 30 courses were planned and mounted by the MESU in two phases during the summer and autumn terms of 1988 and were designed to complement the induction programmes arranged for the advisory teachers by their LEAs. The courses had to address the professional skills needed for advisory work and, in a second stage, to focus on particular phases, subjects or aspects of the curriculum. In addition, it was highly desirable to establish networks of professional relationships between the advisory teachers that would sustain discussion between them, through correspondence, electronic mail or newsletter, after they returned to their LEAs.

HMI evaluated its progress through a report published in 1990. The Inspectorate considered that MESU had made a number of significant contributions between July 1986 and December 1988:

- since the end of 1987 it operated an efficient and professionally run information service which served a clientele wider than that originally envisaged;
- it planned and was responsible for co-ordinating an extensive and successful national programme of general and specialist courses for the new advisory teachers appointed under the DES Information Technology in Schools initiative;
- it facilitated and contributed to a number of in-service training activities for advisers and other professional groups concerning applications of IT to teaching and learning;
- it funded a number of projects which disseminated good practice and useful materials, notably in the humanities and in the field of microelectronics systems, and became involved in a number of novel applications of technology which are likely to affect educational practice in music and scientific measurement;
- it continued to fund the valuable work which provided materials, information and consultancy for those teaching pupils with special educational needs;

- it maintained good publicity for educational uses of IT and some of its own activities in national and educational media.

HMI was critical about the following elements of MESU's work:

- it took too long to get its services and projects launched, especially in the first year when expectations of LEAs and others in the education service had been raised;
- its priorities for development were not always well considered or communicated clearly to intended audiences; and it did not altogether succeed in attracting the interest of many LEA subject and primary phase advisers;
- it frequently sought to do too much, with insufficient delegation to outside agencies; materials it had sponsored and promised to publish for advisory teachers were almost invariably late on arrival;
- until the middle of 1988, with a few exceptions, it had made limited contact with and contributed little support to providers of teacher education;

As I pointed out earlier in Chapter 2 MESU had been particularly active in geography through the energies of Andrea Tapsfield, its Humanities Curriculum Co-ordinator, who instigated a number of initiatives including publications on fieldwork, weather satellites and the Domesday Project. Particularly significant were two major curriculum projects both based at the Institute of Education, University of London. These were the Learning Geography with Computers INSET Pack Project (1986/7) and Project HIT (Humanities and Information Technology) initially funded between 1988 and 1990. Indirectly Andrea's team at MESU had potentially large impacts on geography teachers by liaising with and training advisers, advisory teachers and teacher trainers. In 1988 the Council for Educational Technology (CET) and MESU were merged into NCET (National Council for Educational Technology).

The IT in Schools Initiative (ITIS) 1987-1993

This was a further commitment by the government to IT in schools in England and Wales. The strategy for supporting IT in schools had a number of elements:

- £19m in 1988/9 (£8.5m for hardware and £10.5m for advisory teacher posts)
- The Training Grants Scheme for LEAs, worth £4.8m
- A further £3.3m available to the MESU, plus £0.5m for MESUs share in training the ESG advisory teachers.

Local authorities were expected to contribute 30% of the total funding. DES support was complemented by funding from the DTI which helped pay for NERIS, Interactive Video in Schools and in the early years, support for the purchase of software. Education Support Grants (ESGs) were introduced in 1985 as special elements in the block grant to be disbursed to LEAs by the DES. ESGs were intended to promote desirable changes in providing ITT and INSET and raise the quality of classroom practice by setting objectives and by providing funding for a limited period. In effect this meant a boost for computer systems and equipment in schools and the employment of 700 advisory teachers across England and Wales.

An interim report on this ITIS initiative was published by DES in 1992 and was entitled, 'The Impact of Information Technology in Schools Initiative 1988-1990.' The following is a summary of its findings.

- i) *To date, the initiative has successfully achieved its declared aims to help LEAs to improve the provision and quality of use of information technology in primary, secondary and special schools and, in general, it has been well managed at both national and local levels.*
- ii) *The availability of computers in schools has increased appreciably as a direct consequence of the initiative and, to a lesser extent, of its impact as a catalyst in encouraging LEAs to obtain additional resources from community or industrial sources.*

- iii) *The role played by the LEAs has been critical to the success of the initiative. Different modes of deploying and managing advisory teachers proved successful in meeting identified local needs.*
- iv) *So far, the LEAs evaluation of the impact of the initiative has been weak, with insufficient attention being given to some important issues such as consolidation work within individual schools.*
- v) *Many LEAs experienced difficulty in appointing advisory teachers as the increasing delegation of budgets to schools reduced the number of applicants and made some institutions reluctant to support such secondments.*
- vi) *The training provided for the advisory teachers, particularly at national level, was a notable and generally successful feature of the initiative.*
- vii) *In schools advisory teachers have been most effective when conditions in the schools have been right for good practice to flourish, and when they received the active support of the head teacher or senior staff, but the importance of creating an appropriate climate was not always fully appreciated by head teachers or LEAs.*
- viii) *The advisory teachers' subject or phase expertise has helped schools to view IT as an aid to learning in the curriculum. This thrust of the initiative has been complemented by the National Curriculum requirements which created an upsurge of interest amongst teachers in particular applications, such as word processing, information handling and control technology applications.*
- ix) *Schools value highly advisory teachers working in the classrooms alongside permanent staff over an extended period. Much of this support has made an immediate and highly beneficial impact on the work of classes involved. However, subsequent dissemination and consolidation within schools has proved more difficult. In some schools, poor curriculum practice presented an*

overwhelming challenge to the advisory teacher to introduce good practice.

- x) More attention should have been devoted to easing the advisory teachers' reintegration to their schools at the end of the service.*
- xi) Issues related to the management of IT at school level have been insufficiently addressed in many courses for head teachers.*
- xii) The initiative provided increased opportunities for pupils to use IT and many have become confident and competent in their handling of computers and peripheral equipment (e.g. printers).*
- xiii) The reduced percentage rate of ESG funding in the second and third years of the initiative caused problems for many LEAs.*
- xiv) The initiative has been instrumental in raising awareness and confidence of many teachers in primary, special and secondary schools in the use of IT across the curriculum. As yet few schools have achieved self-sufficiency in assimilating IT. In many cases the development of whole-school policies, including arrangements for assessing IT through learning in other subjects and recording the achievements of pupils, has not become established. Much remains to be done if the good progress made so far is to be consolidated. (Ibid, pp. 1-3)*

Organisations Active in the 1980s

The IT environment in the nineteen eighties cannot be described without mention of a number of IT oriented organisations. CET (the Council for Educational Technology) was established in 1973 as the central organisation in the UK for promoting the application and development of educational technology in all sectors of education and training. Most of the funds came from government departments though it was not a governmental organisation. It merged with MESU in 1988. It generated a range of publications (including Computer Assisted Learning in Geography by Shepherd, Cooper and Walker, 1980); the British Journal of Educational Technology; CET News; and the CEDAR Project (Computers in Education as a Resource). It was essentially a development agency, whose purpose was to bring about beneficial changes in the ways in which education and training took place.

MUSE (Microcomputer Users in Education) was started in 1972 by the Computers in Education Group of the British Computer Society. It sees itself as a national body for co-ordinating activity in schools, colleges of education and other institutions with an interest in using computers in primary or secondary education. 'It is run by teachers for teachers. From infants to sixth form,' (Computers in Schools, 1981, December, Vol.4 No.2). It published 'Computers in Schools' until May 1987 when it became (September 1987) 'Information Technology and Learning'.

Some independent, (initially at least) higher education related organisations, have had a nationwide impact through advice, expertise, research and software development. Government funding over the years has helped to maintain their presence particularly through MEP, MESU and latterly NCET.

The Advisory Unit Computers in Education (AUCE) had its origins in Hatfield Polytechnic and through Bill Tagg. It then became the Advisory Unit for Computer Based Education and an MEP RIC and is now entirely commercially based. AUCE had a group for geography teachers meeting as early as the early nineteen seventies, and I was one of this group advising on software developments.

ITMA (Investigations on Teaching with Microcomputers as an Aid) was based at Plymouth and Nottingham and was founded in 1978 by Rosemary Fraser. Again it has been a collaboration of teachers and researchers offering in-service support, undertaking research and developing software.

Arguably, however, the most influential software producer nationally through the nineteen eighties was the Computers in the Curriculum Project based originally at Chelsea College, University of London.

Its first director was Bob Lewis and subsequently Margaret Cox. The first computer assisted learning work at Chelsea College was begun in 1969 by the Chelsea Science Simulation Project. This formed the basis for later work for CAL across the curriculum. Major funding from MEP meant that a large scale CAL software development team was employed. Much of that software was published by Longman. Particularly important was an early pack of materials with software, teachers' and students' notes. The software involved was: FARM GAME; SOUTH EASTERN RAILWAY GAME; JOINT STOCK COMPANIES TRADING GAME; WINDMILL GAME; DRAINAGE BASIN

MORPHOMETRY; HUMAN POPULATION GROWTH; STATISTICS FOR GEOGRAPHERS. The project later published four pieces of software related to the Schools Council Geography 16-19 Project; MINE; GROWTH; WELF; and PUDDLE. The Project saw the computer offering facilities which would not otherwise be available to the student, for example modelling and simulation processes, the ability to handle large amounts of data and perform complex calculations quickly.

The other two organisations which affected teachers through the nineteen eighties were the BBC and the Open University. The BBC made a big commitment to the broad field of microelectronics by engaging in a number of initiatives. These included the BBC micro; various TV programmes/series such as the Silicon Factor, Managing the Micro, the Computer Programme; the Computer Literacy Project; Telesoftware; BBC Applications Software; the Domesday Project. The Open University offered a variety of computing courses of interest to people in industry, commerce and public services.

Overview of IT in the nineteen eighties

Various surveys have been undertaken to determine the impact of this 'decade of central initiatives.' In particular the DES, later to become the DFEE, produced a number of statistical bulletins carried out in 1985 (Bulletin 18/86 December 1986); 1988 (Bulletin 10/98 July 1989); and 1994 (Bulletin 3/95 February 1995). These were based on surveys of a sample of primary and secondary schools. Their purpose was to determine the then current level of provision and use of information technology in schools and its contribution across the curriculum. The latest bulletin published in 1995 compared data between 1984/5 and 1993/4. Fig 4.6 represents a summary of the data for secondary schools. It shows dramatic increases in ratios of pupils per micro and micros per schools. (fig 4.7) Sources of funding have remained similar across the years except for TVEI which peaked in 1989/90 and subsequently sharply declined (fig. 4.8) Other noteworthy elements of fig 4.6 were the relatively low figures for staff who had undertaken training, were making regular use of micros and were confident in the use of IT, even by the end of the decade.

Wellington, on behalf of the TES, conducted a survey in 1989 of the current provision for educational computing throughout the UK. Questionnaires were sent out in January to one in 10 secondary schools. The survey gained a 41% response rate and the findings were published in the TES on 17-3-89. Much of

Fig 4.6 Secondary Schools: IT Statistics Over Time

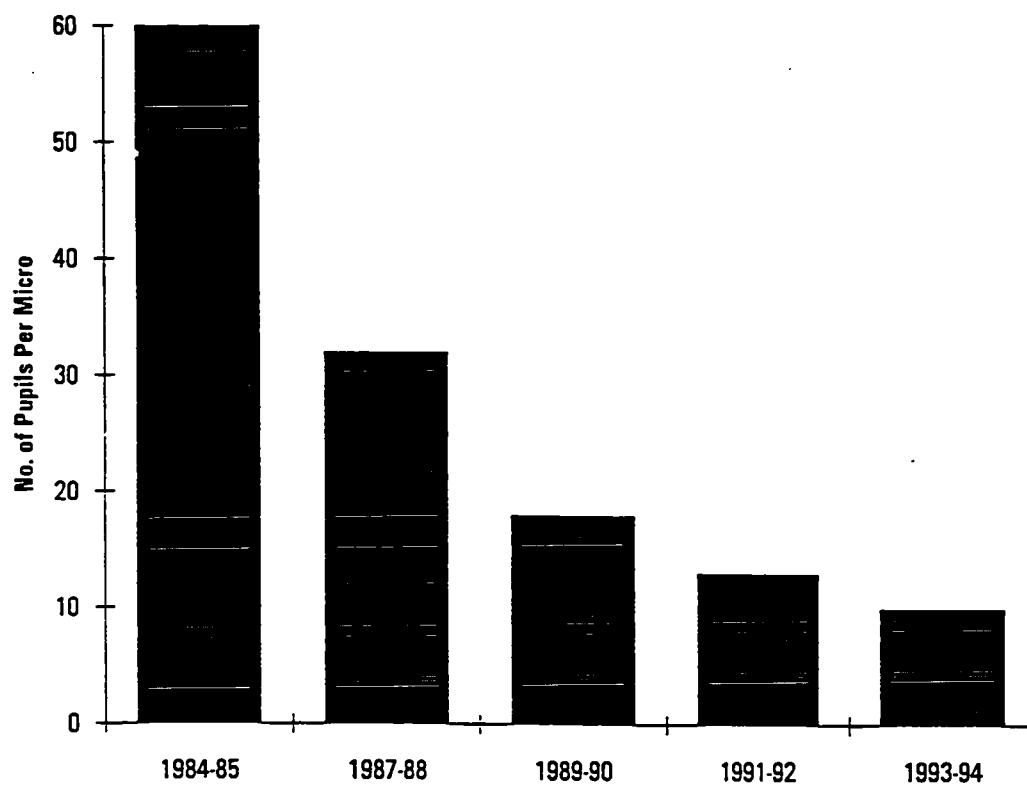
	1984-85	1987-88	1989-90	1991-92	1993-94
Micros per school	13.4	23.2	41.1	58.0	85.1
Pupils per micro	60	32	18	13	10
Total micros available ¹	58,700	96,300	163,400	223,100	308,800
Percentage of staff who had undertaken:					
initial awareness training	-	49	62	37	32
one additional INSET course	-	23	33	22	24
more than one additional INSET course	-	18	21	24	27
award bearing INSET course	-	5	3	3	3
no training	-	-	-	14	14
Percentage of staff confident in IT use					
statement of SEN	-	-	-	-	44
SEN but no statement	-	-	-	-	56
no special needs	-	-	-	-	74
all children	-	48	50	53	-
Percentage of staff making regular use of micros	-	30	34	32	34
Percentage of pupils with 'hands on' experience of micros	-	73	84	86	94
Percentage of schools that reported that IT had made a substantial contribution to:					
teaching	-	17)	38)	30	35
learning	-))	31	40
administration	-	-	-	82	86
Expenditure on IT per school in cash terms					
including administration	£2,250	£4,850	£15,100	£15,450	£23,950
excluding administration	-	-	-	£12,350	£19,350
Expenditure on IT per pupil in cash terms					
including administration	£3	£6	£21	£21	£29
excluding administration	-	-	-	£17	£24
Percentage sources of funding:					
Capitation/School budget	53	51	29	52	62
LEA/Central Government	18	21	21	11	10
PTA or Parent	19	9	7	5	2
Other	10	11	12	7	4
TVEI	-	8	31	25	12
Technology Initiative	-	-	-	-	10
Total expenditure on IT in cash terms ¹	£9.8m	£20.2m	£60.1m	£59.5m	£86.9m

- Not available

1. National estimate for all schools in England

Fig 4.7 Micros in Secondary Schools: Over Time

RATIO OF PUPILS PER MICRO



RATIO OF MICROS PER SCHOOL

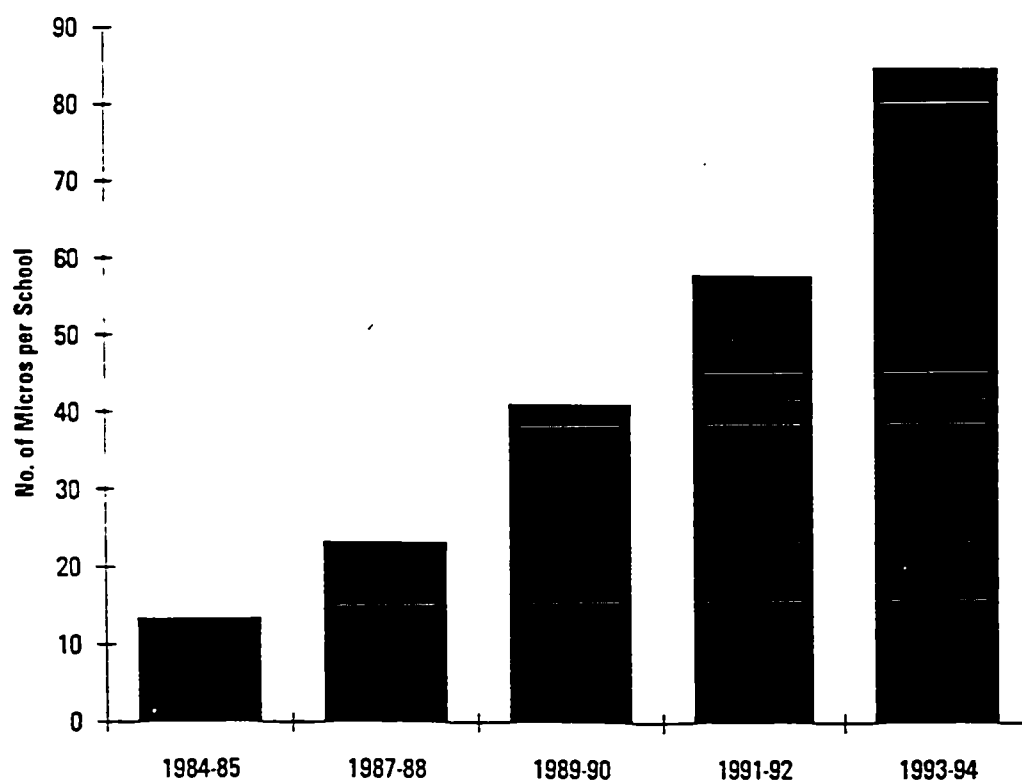
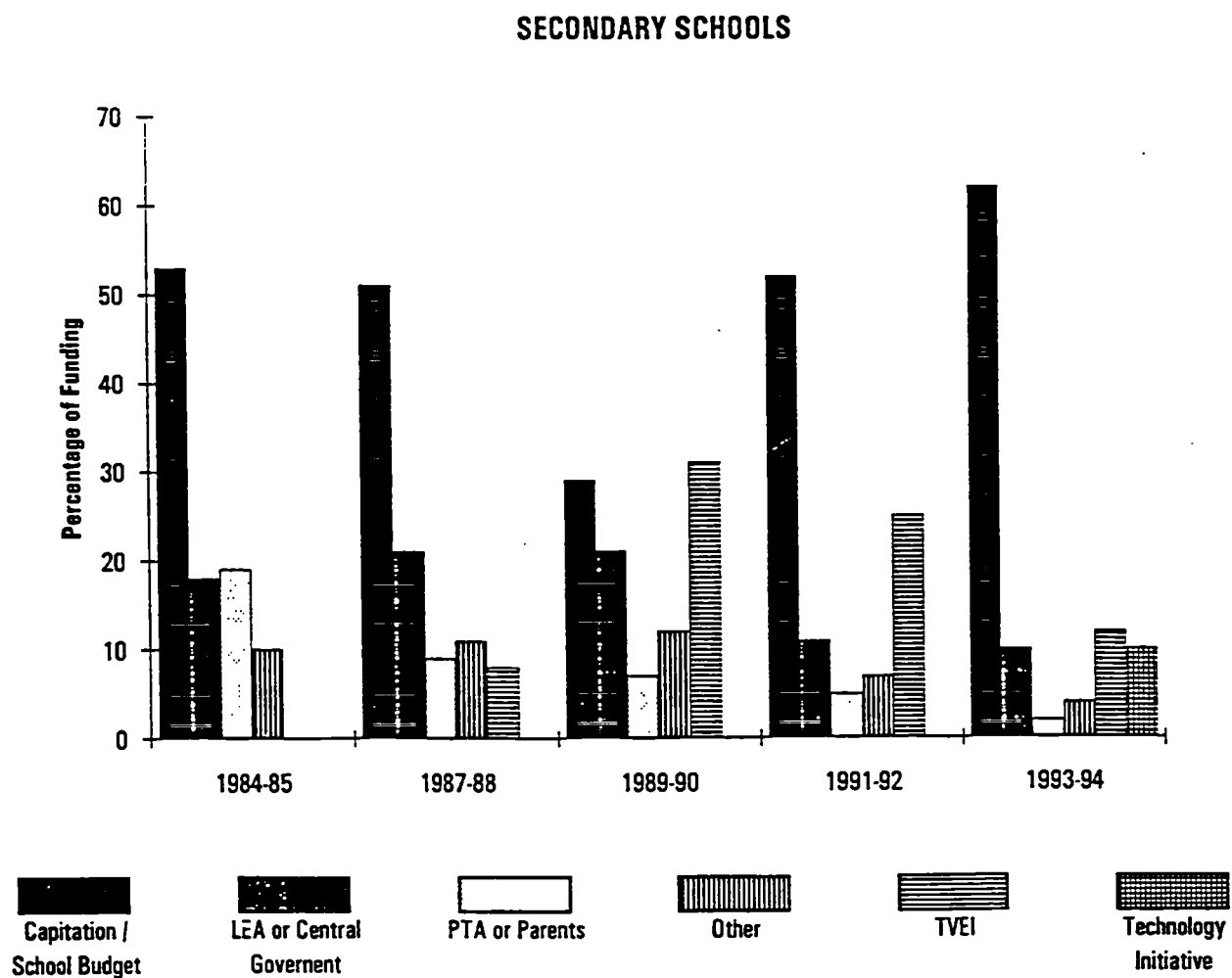


Fig 4.8 Sources of Funding for Information Technology



the focus of this survey was on trends in hardware purchase but some data was more curriculum oriented. In particular there was a section on training. As Wellington (1989) put it, "It is not enough to put computers and software into schools and expect teachers to know what to do with it. That is one message which comes across in the rather haphazard image of IT training which the teachers depict".

Earlier (1987) Wellington wrote up the "Skills For the Future" Project which was undertaken in 1986 with funding from the Manpower Services Commission. The project set out to investigate the links between education and employment in the field of information technology. In his report Wellington put forward a model for considering the development of computer education in secondary schools by suggesting various stages (fig. 4.9). His project suggests that most schools see themselves at Stage 2. Some had begun to use CAL in a number of subjects particularly science and maths and many expressed the intention of introducing CAL across the school curriculum. The extent to which geography used IT in their teaching compared to other teachers was considered in Chapter 2.

I then attempted to get an overview of IT developments in the nineteen eighties by studying the TES. Throughout the decade the TES has had a number of computers/IT supplements each year. I studied such supplements between 1983 and 1989, the period over which this research was undertaken. Suffice is to say that these supplements appeared more frequently over these years and pervading each was a considerable number of adverts for hardware and software; articles on new curriculum developments; and a good number of discussion articles. What did increase in frequency over the decade were subject specific items, hardware, software and book reviews; and pieces on teacher training and in-service.

I undertook a similar survey of issues of the Journal of Computer Assisted Learning (JCAL) of which I am on the editorial board. The first issue of JCAL was in March/April 1985. Most articles concern generic often pedagogic concerns and are not curriculum/subject focused. The one identifiable trend was the much greater frequency of articles on initial teacher education as the decade progressed.

There are two frameworks that help make sense of the curriculum impacts of IT developments in the 1980's. Cerych (1975) points out that the introduction of IT into the curriculum has been unique in exerting a variety of pressures or

Fig 4.9 From Vertical to Horizontal: the evolution of IT education in secondary schools (after Wellington, 1987)

- Stage 1: Computer Studies as an examination subject: rapid rise in entries. 'Vertical' approach to IT education
- Stage 2: Computer awareness across the board, to all ability ranges and sexes e.g. to the whole first year, with an element of in-service education for staff as well as pupils.
- Stage 3: Introduction of computers across the curriculum in separate subjects to enhance learning in those areas, partly as a result of the 'diffusion' process in stage 2 (i.e. CAL across the curriculum)
- Stage 4: Increasing pressure on computer studies as a separate subject, and on the computer room as a resource for the whole school.
- Stage 5: Integration of computing and computing resources into the whole curriculum and classroom practice. 'Horizontal' approach to IT education.

influences on the educational system. At the IT-education interface he identifies three factors as key agencies. These he refers to as pedagogical, sociological and economic. The pedagogic factor concerns IT related learning as being interactive and thereby active and enjoyable to participate in. The sociological pressure or factor comes from parents, local authorities, successive governments and European and international organisations. Finally there are economic pressures since IT had become so pervasive in all economic sectors and this had led in the secondary sector of education to the vocational significance of IT to be stressed. These unique pressures, Cerych argued, led to the rapid rate of uptake, in some respects, of IT in secondary schools.

In addition Sendov (1986) suggested IT in education would go through three 'waves of development'. In the first wave computers in schools were introduced virtually as a new educational facility, almost 'dropped' in by courtesy of the DTI. As a result it was very much an appendage to education similar to the overhead projector, tape recorder or film projector. In the second wave the value of IT as an educational resource began to be appreciated and developed. IT began to be seen as cross curriculum rather than the province of the expert. The third wave which is as yet largely theoretical will occur when IT influences the content and aims of education itself, as well as the method and system of teaching. Sendov argued that this may occur with the 'mass presence of the computer in the school environment'. Arguably this would cause a re-appraisal of the nature and aims of separate school disciplines in the context of powerful information technology systems (for example, Papert, 1980). Most schools in the UK in my study period sit somewhere at or near the boundary between wave one and two with wave two for the majority being a rhetorical ambition!

Chapter Five

Core Data Analysed By 'Portrait' And 'Theme'

Core Data

The core data in this study is derived from interviews with 15 teachers, predominantly heads of departments and 8 advisers/advisory teachers in three local education authorities (LEAs).

A choice of three LEAs had first to be made. LEAs 1,2 and 3 were chosen since they were located in three different Microelectronics Education Programme (MEP) (1979-86) regions. LEA 1 was in Capital Region; LEA 2 in Chiltern Region; and LEA 3 in Eastern Region. The intention was to identify what different impacts, if any, MEP regions had on their constituent schools. Direction and policies in each region, considered in chapter 3, were quite distinctive.

In addition these were LEAs on the edge of the former Greater London Council (GLC) boundary, of a similar area and population size and with a mix of socioeconomic status. Since I live within the old GLC boundary I was able to get to them without too much difficulty. In addition, the educational 'cultures' of each LEA were distinctive, again as discussed in chapter 3. Finally LEAs 1 and 2 had advisers with whom I had built up some professional contact and were very receptive to such research work being conducted in their areas. Coincidentally one had been a former MA student and the other a fellow student at the school I attended.

Key early telephone discussions with the three advisers took place to determine their support. When that had been confirmed, a letter requesting access to the schools in each LEA was written to each Director of Education (see fig 5.1) Once a positive reply had been received, detailed discussion began with the three advisers to determine which schools to visit in order to interview the heads of department.

I relied on the knowledge each adviser had of his/her schools and took their advice as to which heads of department (HOD) to contact. They tended to be HODs who were judged likely to be sympathetic and interested in taking part in such interviews and whose departments were amongst the strongest in that LEA. For instance, Tom David's (LEA 1's Humanities Inspector) judgement as

FIGURE 5.1

SIMULATION OF LETTER SENT TO DIRECTOR OF EDUCATION

21 December 1982

Director of Education

Dear

I recently (1 December 1982) had a meeting with Tom David, your Humanities Inspector about some research I am proposing to undertake. It concerns computer assisted learning in secondary school geography and I enclose an outline of the research for your attention. As far as LEA 1 is concerned, it would involve a three-year period, discussions with some geography teachers within the Borough as well as with Tom David himself.

Given my interest in this area of the curriculum, I hope my expertise may be of value to your teachers.

Could I count on your support in this exercise?

Yours sincerely

Ashley Kent
Tutor and Lecturer in Geographical Education

to 'innovatory' departments was borne out by subsequent data. When (on my behalf) he sent out CAL geography questionnaires to all secondary school HOD's, the 15 schools not researched into (ie. 15 out of the 22 in the LEA) had either no programs (software) or CAL activity or a minimum of either.

HODs were interviewed since they were seen as critical and important middle managers in the school system and best able to discuss the work of their departments. They were seen as potential change-agents with the power to effect change.

Once these HOD's had been identified, the LEA advisers sent out a letter (Fig.5.2) and a questionnaire (5.3) to each HOD early in 1983, to determine some preliminary information about computer assisted learning (CAL) in geography for each school. These were returned via the adviser to me and I then contacted each HOD to arrange a time, place and date for an interview. The purposes of the research and the interview were explained and agreement confirmed by each HOD.

The first batch of interviews took place in late 1983 and early 1984 and were usually held in a departmental office or occasionally a teacher's home. At the interview, permission was sought to use a tape recorder. If a recorder was not used for any reason, notes were taken during the interview and amended as soon as I returned home.

The checklist of points covered by the interview is shown in fig 5.4. Most interviews typically took 45 minutes but some lasted well over an hour. On returning from the interview I added observations and interpretations as I saw them (to the tape recorder as I drove back home). Where interview notes were taken, I would add such comments as soon as I returned home. These were very much initial feelings about the interview.

Subsequent to the interview a letter of thanks was sent to the interviewee and each interview was then transcribed from the audio tape. Appendices 5.1 and 5.2 are examples of 1983 and 1985 interviews with Sara Norris from school 1F.

Follow-up interviews were conducted in 1984/5 (usually late 1984, early 1985). These tended to be considerably shorter in length (typically 30 minutes) and focused particularly on changes since the first interview.

These were then transcribed in a similar fashion to the first round of interviews.

**Fig 5.2 Mock-up of letter sent out by Tom David
to Heads of Geography in LEA 1**

To: Heads of Geography Departments,
all Secondary Schools

21st February 1983

Dear Colleague,

Please find enclosed a questionnaire from Ashley Kent of the Institute of Education. It has been agreed that he will support our work in evaluating CAL in Geography and we will assist in some research he is doing.

I should be grateful if you could find the answers and return the sheet to me at the Town Hall by FRIDAY, 18th MARCH.

Thank you for your help,

Yours sincerely,

TO: HEAD OF GEOGRAPHY DEPARTMENT

Fig 5.3 An Example of a Completed Questionnaire

COMPUTER ASSISTED LEARNING IN GEOGRAPHY

1. NAME OF SCHOOL :
2. IS THERE A MICRO COMPUTER IN THE SCHOOL? YES / ~~NO~~
3. FOR EACH MICRO COMPUTER IN THE SCHOOL PLEASE ENTER THE FOLLOWING DETAILS (if known)

	TYPE (Pet, 380z)	Memory	Printer	High Res. Graphics	Drive
COMPUTER 1	3802	32 k	Yes/ No	Yes/ No	Disc/ Cass
2	3802	32 k	Yes/ No	Yes/ No	Disc / Cass
3	BBC ModB	32 k	Yes/ No	Yes/ No	Disc / Cass
4	BBC ModB	32 k	Yes/ No	Yes/ No	Disc / Cass
5		___ k	Yes/No	Yes/No	Disc/ Cass
6		___ k	Yes/No	Yes/No	Disc/ Cass
7		___ k	Yes/No	Yes/No	Disc/ Cass
8		___ k	Yes/No	Yes/No	Disc/ Cass

4. WHICH OF THE FOLLOWING STATEMENTS IS MOST APPLICABLE TO YOUR SCHOOL?

- (a) The Computer is kept in a central store and can be taken to a geography room when required No
- (b) The Computer is generally available for use in a special room No
- (c) Another arrangement (Please describe)

✓
X

Until recently the school had only 1 computer which was used only for Computer Studies. However now that the number of computers has increased it is hoped that computer use will spread to other departments although at the moment it is difficult to say in detail how this ~~the~~ will be done

5. DOES THE SCHOOL HAVE ACCESS TO A MAIN-FRAME COMPUTER? ~~YES~~ / NO
(e.g. by telephone link to a local college)

6. PLEASE WRITE BRIEF DETAILS OF ALL THE GEOGRAPHY LESSONS TAUGHT BETWEEN
EASTER 1982 AND EASTER 1983 USING THE FOLLOWING PROGRAMS.

NONE -

PROGRAM	Number of lessons Easter 1982 Easter 1983	Approx. age of pupils	Approx number of pupils in class	Context (e.g. part of London A level, 2nd form mapwork)
Schools Council DEMOG 1 DEMOG 2 FARM MILL MORPH RAIL TRADE G STATS Other Programs CHAGGA HURKLE GRAVITY REILLY TRAFFIC WEBER ROUTE HIKE Other Programs (please specify source if poss.)				

Fig 5.4 Checklist of points to frame interviews

1.	
Background to School and Geography Department	Staffing and experience Type/size school Courses in geography - number of students Geography department's standing in school
2.	
Computing Generally	Computer facilities - history of them Person in charge of computing Computing courses
3.	
	Geography and CAL Any Courses? Any Software? Lessons/programs taught? Knowledge of programs
Geography and Computing	Views on CAL geography (Statements) Information re CAL geography - Sources? Links with adviser
	Links with other geography teachers
	What is MEP?
	Future views on CAL geography?
	What are constraints at present?

In June 1985 a letter was sent to all interviewees (fig 5.5) expressing thanks for their help and asking for permission to write up the research, assuring them of complete anonymity. In addition a questionnaire (fig.5.6) was included with the letter to ascertain the latest developments in respective departments.

On June 26, 1989 a letter (fig 5.7a) was sent to each interviewee with a final questionnaire (fig.5.7b). In certain cases where activity had been particularly great or, on the other hand limited, interviews were conducted in 1989 or later. This was true of Saul Jacobs (School 1E) in July 1989 and again in May 1992; Martin Moseley, (School 1G) July 1989; Anton Archer (School 2A) July 1989; Sam Mars (School 2B) July, 1990; and Marlene Southern, July 1989. The overall pattern of interviews is shown in figures 5.8, 5.9 and 5.10. A 'Who's Who' of people interviewed in LEA 1 is shown in fig. 5.11. Needless to say these are all pseudonyms.

Beginning to Analyse the Data:

Developing Portraits of Departments in LEA 1

The first stage was to carefully read the transcripts of the interviews with the 16 teachers from the three LEAs as well as those with geography advisers and IT/computer advisers. Departments varied greatly across the 16 studied and that was also true of the level of activity and indeed sophistication in the use of computers in geography classrooms. Similarly advisory staff differed widely in knowledge, attitudes and experience of CAL in geography.

Even at this early stage of perusing the transcripts, a clear distinction could be drawn between levels of activity, attitudes and sophistication concerning CAL geography in LEAs 1 and 2. In LEA 1 there was much more activity (in general) and a genuine interaction through conferences, meetings and support between teachers and advisers. LEA 2 showed very little activity with regard to computers in geography, with LEA 3 somewhere in between.

A critical decision was then taken to focus in on LEA 1 in particular as a model of relatively good practice with some, though less detailed focus on LEA 2, which was at the other extreme. It had become more than clear at the time that relatively few geography departments were 'active' in CAL geography. Many constraints and disadvantages of taking up the innovation had become almost conventional wisdom and it seemed sensible to tease out an understanding of a positive model of take up. Given that strategic research



University of London Institute of Education

20 Bedford Way, London WC1H 0AL

Telephone 01-636 1500

Director: Professor Denis Lawton, BA, PhD

Department of Economics, Geography and Business Education
Geography Education Section — Ext. 233

June 1985

Dear Colleague

I would like to take this opportunity of thanking you for your help to me over the last two years in my research work on the take-up of computer assisted learning in geography. I have now reached the writing-up stage of the work and intend to preserve absolute anonymity of individuals, schools and local education authorities. Retaining this anonymity I should like to quote selectively from interviews with teachers and to place my own interpretation on these. If you have no objection to this could you please indicate this by signing the bottom of the letter and returning to me in the stamped addressed envelope provided? The final product will be an unpublished thesis for a higher degree which I am hoping will have important policy implications for the management of curriculum innovation.

I have also included with this letter a brief checklist which will allow me to have the latest information on your school, department as well as your own views. Again I would be most grateful if you could return that with this signed letter.

I hope things for you are going as well as can be expected in this difficult period in education. Please do not hesitate if I can be of help to you in any way.

Yours sincerely

Ashley Kent
Tutor and Lecturer in Geographical Education.

Fig 5.5 Letter of Thanks Sent to All Interviewees

NAME OF SCHOOL

Fig 5.6 Questionnaire Sent Out in June 1985

THE GEOGRAPHY DEPARTMENT

1. STAFF

Role within Geography Department

No. of Geography Lessons taught per week

Current responsibilities in school including other subjects taught

Number of years teaching

Number of establishments taught in

Types of establishments taught in

Qualifications

Higher Education Establishment Attended

Salary grade/scale

Yourself	2	3	4	5	6

2. GEOGRAPHY TAUGHT

	Brief details of syllabus taught	No. of Students	No. & Size of Groups	Any other comments
YEAR 1				
YEAR 2				
YEAR 3				
YEAR 4				
YEAR 5				
17+				
18+				

3. FIELDWORK

Could you briefly describe the fieldwork you undertake with each year?

Year 1

YEAR 2

YEAR 3

YEAR 4

YEAR 5

17+

18+

EDUCATIONAL COMPUTING IN THE SCHOOL

4. PERSON IN CHARGE OF COMPUTING IN THE SCHOOL

1. What is his/her title?
2. What is his/her role?
.....
3. What is his/her experience?
.....
4. What is his/her salary grade/
scale?
.....
5. What is his/her policy towards
the use of computers in your
school?
.....
6. Any other details?
.....
.....

5. RECENT DEVELOPMENTS

1. Could you briefly describe any recent developments in the use of computers in your school?

2. Are you aware of any proposed developments for the near future?

6. COMPUTERS AND GEOGRAPHY

1. Please list those programs you have access to or own.

2. List the programs you have:-

- a) Heard about but not examined
- b) Looked at the description
- c) Had demonstrated
- d) Quickly run through
- e) Tried with some pupils

3. For the present academic year (1984-85) what programs have you and your colleagues used and with which year groups?

- YEAR 1
- YEAR 2
- YEAR 3
- YEAR 4
- YEAR 5
- 17+
- 18+

4. Have you any observations/views on the use of computers in geography which you would like to make?

Director: Professor Denis Lawton, BA, PhD

**INSTITUTE
OF EDUCATION**
UNIVERSITY OF LONDON



Telephone: 01-636 1500
FAX No.: 01-436 2186

20 Bedford Way
London WC1H 0AL

**Department of Economics, Geography
and Business Education**
Geography Education Section

26 June 1989

Dear Colleague

Between 1983 and 1985 I interviewed yourself (or your predecessor as head of geography at your school) about your (their) views on the use of computers in the teaching of geography and the extent to which you (they) used information technology.

To bring my research up to date (it is a longitudinal study of geography and computers throughout the nineteen eighties) could you complete the enclosed questionnaire by July 14th please? I have enclosed a sae for your convenience.

For your interest I have enclosed some sheets which may be of interest to you.

Yours sincerely

Ashley Kent

Fig 5.7a Letter Sent to Each Interviewee

Fig 5.7b Final Questionnaire Sent Out on 26 June 1989

The use of computers in the teaching of geography

Questionnaire to Heads of Geography/Senior Geography Teachers

Answers in note form please!

1. Major changes in School since 1985

Please list

2. Geography Department

Please list changes since 1985 including staffing, curriculum and popularity of the subject.

3. Computing Facilities

What computing facilities are available in your school in general and for geography in particular?

4. Geography software/General Purpose Software

What software is available for geography teachers?

5. Geography lessons and the Use of Computers

What use of computers do you make with geography pupils? Please list the software and pupil groups involved.

6. Your Views on the use of computers in geography

- a) Please list the opportunities you see in the use of computers in geography.
- b) Please list the limitations you see in the use of computers in geography.
- c) Elaborate on why your school does/does not use computers in the teaching of geography.

7. Inservice courses/days provided by your LEA/School

Please list courses/days to do with the use of the computer in geography provided by your School/LEA in the last 4/5 years.

8. Any other comments you wish to make (especially on changes in the last 4 years or so)

Thank you very much for completing this. It would be much appreciated if you could return by July 14th in the sae provided.

W. A Kent
Institute of Education
University of London
20 Bedford Way
London WC1H 0AL

Fig 5.8

Interviews in LEA 1**1. Schools**

School	Major Interviewee	Dates of Interviews	Date of Questionnaires
1A	Mrs Rolfe	26/11/83 8/5/85	30/6/89 27/7/85
1B	Mr Davies	25/11/83 3/5/85	13/7/89 10/8/85
1C	Neil Pope	20/12/83 19/3/85	Neil had left school 1/7/85
1D	Tony Lichfield	21/2/84 29/3/85	17/7/89 24/9/85
1E	Saul Jacobs	25/11/83 29/3/85	(Interviewed) 18/7/89 2/5/92 17/6/85
1F	Sara Norris	20/12/83 20/4/84	1/7/89 24/9/85
1G	Martin Moseley	21/2/84 19/3/85	Became Advisory Teacher 11/7/85

2. ADVISERS

Name	Title	Date of Interview
Paul Gomer	IT Adviser	20/12/84 3/6/87
Mr David	Humanities Inspector	22/12/82 20/12/83 20/12/84
Martin Moseley	ESG Advisory Teacher	18/7/89

Fig 5.9

INTERVIEWS IN LEA 2

1. Schools

Schools	Major Interviewee	Dates of interviews	Dates of Questionnaires
2A	Anton Archer with PGCE students	5/3/84 11/2/85 17/7/89 13/3/84	
2B	Sam Mars	30/11/83 1/2/85 31/7/90	19/7/85
2C	Cheryl Dean	22/2/84 1/3/84 1/2/85	9/7/85 4/7/89

2. Advisers

Title	Name	Date of Interview
Gail Joplin	General Adviser	11/1/83 21/1/85
Sidney Boyce	IT Inspector	11/1/83 21/1/85
Marlene Southern	ESG Advisory Teacher	17/7/89
Don Godber	Teacher's Centre Warden	25/2/85

Fig 5.10

INTERVIEWS IN LEA 3

1. Schools

Schools	Major Interviewee	Dates of Interviews	Dates of Questionnaires
3A	Chris Ridley	29/11/83 26/6/85	19/7/85
3B	Mr Golden	18/11/83 18/6/85	16/7/85
3C	Gail Riley	18/11/83 22/3/85	13/8/85
3D	Ken Pritchard	18/12/83 11/2/85	1/7/89 22/7/85
3E	Vernon Moteou	16/1/84 28/2/85	8/7/85

2. Advisers

Name	Title	Date of Interview
Michael Cox	(Humanities Adviser)	16/1/84 10/12/84
John Milton	(Field Study Centre Warden)	21/1/85

Figure 5.11 LEA1 Who's Who

**Deputy Director of Education
(Former Maths and Science Inspector)**

- Tom David
(Humanities Inspector 1982-90)

- Paul Gomer
(Inspector for Computer Education 1984)
Previously at schools 1D and 1E

- Martin Moseley
(1989 onwards AT and head of urban
studies centre) 1983/84 MA. 1986/87 INSET
pack coordinator

- Arthur Sterling
(AT for computer education 1985 on)

School 1A

- Mrs Rolfe (HoD since 1979)

School 1B

- Mr Davies (HoD since 1963; 1984/85
MA; retired 1989)

School 1C

- Neil Pope (Deputy Head; was HoD;
1977/78)

School 1D

- Tony Lichfield (Senior Housemaster MA
since 1975; was HoD; 1983/84 MA; retired
1990).

- Ken Box (HoD since 1975; 1979/80 MA;
deputy head 1990)

- Matthew Johnson (HoD 1989 on;
1988/89 MA)

School 1E

- Saul Jacobs (HoD 1980-91; 1991 on Senior
Teacher; MA 1986/87)
- Sam Royce (2nd in dept; left 1988)

School 1F

- Sara Norris (HoD since 1984; Arrived 1979)
- Bob Thompson (HoD until 1984; At school
nearly 40 years)

School 1G

- Martin Moseley (HoD; 1983/84 MA; 1989
on head of urban studies centre and AT)

Also

- Martin Bland
(HoD of Kent Independent School with longstanding CAL interests)

- Ros Wilton (ILEA HoD; AT work on CAL geography).

HoD = Head of department
AT = Advisory Teacher
MA = MA Geography in Education course.

decision, further analysis of interview data for LEA 3 was discontinued. The decision was also in line with the spirit of case study research which has the strength of offering in- depth insights from a limited number of cases, (see chapter 3).

The remaining data had to be reorganised into a more standard and structured data set to make comparison and data analysis more possible.

These were called '**portraits**' and had a standard format. Six categories for the portraits were identified through study of the transcripts. These were:

Background: a brief paragraph on the type and size of school.

Interviewee: a section on the personal biographical/professional history of the head of department; his/her knowledge of, experience with and attitudes to CAL. To help responses to the latter the checklist of statements was referred to from the four-sided questionnaire used in part as the basis for the interview(Fig.5.12).

Geography Department: to do with the size and strength, popularity of the department, the numbers of staff and pupils and access to software and hardware. It addressed the use of computers in geography teaching and the response of staff to the innovation.

The School: this section determined the nature, identity and role of the person responsible for computing in the school as well as the involvement of the head in such developments.

The LEA: portrayed the nature of the role of advisers in supporting the teachers and their views on the innovation. Provision of courses, meetings and hardware/software support was described.

National Picture: considered the impact of national level developments such as conferences and the MEP on activity in that school.

The detailed portraits of these 1983/4 interviews are shown in appendices 5.3 to 5.9. In writing up the 1984/5 interviews the stress was on change so these are much shorter, expressed in continuous prose and not sub-divided into 5 elements as had been done for the earlier interviews. A set of comments were added, as a form of 'post-script', based on the responses to the 1989 questionnaire which was returned by most schools.

Fig 5.12 Questionnaire Used as Basis for Interview

UNIVERSITY OF LONDON

INSTITUTE OF EDUCATION

COMPUTER ASSISTED LEARNING IN GEOGRAPHY

I SCHOOL DETAILS

1. School telephone number _____
2. Name of Head of Geography _____
3. Type of school (please tick one or more boxes)

		Age range	
Comprehensive	<input type="checkbox"/>	11-18	<input type="checkbox"/>
Grammar/ Selective	<input type="checkbox"/>	11-16	<input type="checkbox"/>
Independent	<input type="checkbox"/>	13/14-18	<input type="checkbox"/>
Single sex	<input type="checkbox"/>	13/14-16	<input type="checkbox"/>
		16-18	<input type="checkbox"/>

PLEASE LEAVE BLANK				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

II SCHOOL COMPUTING FACILITIES

4. Is there a micro computer in the school? YES/NO
5. For each micro computer in the school please enter the following details (if known).

	Type (eg Pet, 380Z)	Memory	Print out	High Resolution Graphics	Drive
Computer 1		____ k	Yes/No	Yes/No	Disk/Cass
2		____ k	Yes/No	Yes/No	Disk/Cass
3		____ k	Yes/No	Yes/No	Disk/Cass
4		____ k	Yes/No	Yes/No	Disk/Cass

6. Which of the following statements is most applicable to your school?

- (a) The computer is kept in a central store and can be taken to a geography room when required
- (b) The computer is generally available for use in a special room
- (c) Another arrangement (Please describe).

☐
☐
☐

7. Does the school have access to a main-frame computer? (e.g. by telephone link to a local college). YES/NO

III COMPUTING IN THE GEOGRAPHY CURRICULUM

The questions in this section refer to geography lessons where the computer was present and in use (i.e. not to preliminary or follow-up lessons where the computer was not actually being used.)

- 8. Please estimate the total number of geography lessons taught using a computer in your school since 1st January 1979.
- 9. Please write brief details of all the geography lessons taught between Easter 1981 and Easter 1982 using the following programs:-

☐

<u>PROGRAM</u>	<u>No. of lessons</u> Easter '81 - Easter '82	<u>Approx. age</u> of pupils	<u>Approx. number</u> of pupils in class	<u>Context</u> (e.g. part of JMB A level, second form mapwork etc.)
Schools Council				
DEMOG 1				
DEMOG 2				
FARM				
MILL				
MORPH				
RAIL				
TRADE				
G STATS				
Other Programs				
CHAGGA				
HURKLE				
GRAVITY				
REILLY				
TRAFFIC				
WEBER				
ROUTE				
HIKE				

<u>PROGRAM</u> continued	<u>No. of lessons</u> Easter '81 - Easter '82	<u>Approx. age</u> of pupils	<u>Approx. number</u> of pupils in class	<u>Context</u> (e.g. part of JMB A level, second form mapwork etc.)
Other Programs (please specify source if possible)				

10. When do you anticipate the next geography lesson will be taught using a computer? _____ (month) _____ year.

IV IN-SERVICE TRAINING

11. Please enter below details of any courses in computing (whether related to geography or not) attended by you or by members of your geography department. Please do not identify colleagues by name.

Colleague	Years teaching experience	Approx. date of course	Number of course days	Where course was held
1				
2				
3				
4				

V YOUR VIEWS ON COMPUTER ASSISTED LEARNING AND GEOGRAPHY

12. Please tick the appropriate column which best describes your attitude to C.A.L. and geography teaching.

SA = Strongly Agree
 A = Agree
 I = Indifferent
 D = Disagree
 SD = Strongly Disagree

- | Statement | SA | A | I | D | SD |
|--|----|---|---|---|----|
| a. There are too many problems involved in using computers in geography teaching. | | | | | |
| b. Until more micros are available to teachers, there is little point in using C.A.L. in geography classrooms. | | | | | |
| c. Geography programs are of low quality. | | | | | |
| d. Geography programs do not suit present geography courses. | | | | | |
| e. Geography teachers along with other teachers should help to develop 'computerate' pupils. | | | | | |
| f. The main value of micro computers is to perform statistical analysis of geographical data. | | | | | |
| g. The main value of micro computers is for the storage of geographical information for retrieval. | | | | | |
| h. There is limited educational value in using C.A.L. for geography teaching. | | | | | |
| i. There is too much teacher-time involved in learning about C.A.L. for geography teaching. | | | | | |
| j. C.A.L. should transform the geography classroom of the 1980's. | | | | | |
| k. There is little help or information available about using the computer in geography teaching. | | | | | |
| l. C.A.L. can help children's learning by simplifying the real world in computer games and simulations. | | | | | |
| m. C.A.L. can help to motivate pupils in geography lessons. | | | | | |
| n. In the present world of 'cuts' C.A.L. and geography should take a very low priority. | | | | | |
| o. C.A.L. can help children handle a range of variables in a problem solving situation. | | | | | |

Thank you for your help in completing this questionnaire.

This distillation process whereby raw transcripts became structured 'portraits' is inevitably value laden. I used my own approach and vision to 'paint' these 'portraits' and value judgements are particularly evident in the 'post scripts'.

Developing Themes from the Portraits

The portraits of 7 schools showed 7 separate pictures of geography and computing in LEA 1 between 1983 and 1989. The question now was how to identify and detail common elements of these 7 stories. How could I unpack the complex range of influences (actors and environments at different levels) which encouraged or dampened the take up of this innovation? Major 'domains' struck me when studying the portraits.

- First there was the school context;
- second the departmental context;
- third the head of department;
- fourth the environment within the school for IT and geography;
- and finally influences from beyond the school.

Figure 5.13 shows the domains and sub categories developed. Comments in brackets give some indication of the detail included.

Portraits of Advisers in LEA1

Interviews were held with the humanities inspector (Tom David) and the inspector for computer education (Paul Gomer) between 1982 and 1987 (see fig 5.8). The 'portraits' of these interviews are shown in appendices 5.10 and 5.11 and are written in continuous prose since the reading of the transcript of the interviews did not generate any obvious common elements. Martin Moseley who became head of the urban studies centre and part time advisory teacher for humanities was also interviewed in 1989 having already been interviewed in 1984 and 1985 as head of geography in school 1G. No attempt at a portrait of him as an adviser was made since he had only just taken up the post. Comments on that interview are included at the end of appendix 5.9.

Themes from the Portraits

The data was then regrouped under four broad headings and these are shown in appendices 5.12 and 5.13.. Some common elements emerged from this exercise.

Fig 5.13 Domains and sub categories developed for the themes

- 1. The school environment**
 - 1 A Head and curricula (knowledge of IT; where are his/her priorities; does this create an environment for change?)
 - 1 B IT in this school (Policy, hardware and software)
 - 1 C IT Co-ordinator (Gatekeeper? facilitator?)
 - 1 D Miscellaneous re-school (Morale and anything else)
- 2. The department**
 - 2A Strengths of department (Numbers of pupils and status in school)
 - 2B Staff (Stability, qualifications, experience)
 - 2C Type of geography (Courses, progressive, changes?)
 - 2D Outside links (GA locally and nationally, networks, involvement)
 - 2E Staff as a team (Networks and influential individuals)
 - 2F IT knowledge/expertise of staff
- 3. Head of department (or senior geography teacher)**
 - 3A Professional background (Experience and qualifications)
 - 3B Management style/strategy (Personal qualities, policy)
 - 3C Knowledge/attitudes re IT (Vision)
- 4. IT and geography**
 - 4A Level and nature of activity (Trend over time)
 - 4B IT Resources (Access, hardware, software)
 - 4C Plans and policy (re IT and geography)
- 5. Beyond the school**
 - 5A LEA
 - 5B National

Background/career path

Paul Gomer's career in education has been entirely in LEA 1. 12 years in total were spent in two schools and subsequently (since 1984) in the advisory/inspector service of that LEA. However his perspectives were national, having served on various regional and nationwide bodies and thereby he had developed nationwide contacts in educational computing.

Tom David taught in North East England and became an advisory teacher there before becoming humanities inspector for LEA 1 in 1982. By 1990 he had been appointed Chief Inspector for an adjoining outer London LEA. He too had nationwide experience and contacts through 'advisers' groups and the NCET.

Common elements appear to be a knowledgeable, wide perspective beyond the world of LEA1 and an energy and ambition that led to relatively rapid promotion.

Initiatives and policy

Paul Gomer formulated LEA1's policy on four areas of computer use - word processing; databases; logo; and simulations. In addition he had clear software and hardware purchasing policies and developed several written guidelines for the teachers in the LEA. He successfully helped to get an advisory teacher for computer education appointed (Arthur Sterling) and worked closely in support of subject advisers and in particular subject related user groups including Tom David and the geography group.

Tom David was equally active in the setting up of initiatives and formulation of policy. He supported the secondment for MA courses of HOD's of geography to a local University School of Education and made full use of the expertise they thereby gained, particularly through their dissertation research. He saw the vital role of HOD's in curriculum development and in particular their contribution to working groups for various initiatives. Throughout he saw Martin Moseley as the co-ordinator (on his behalf) of various groups not least the CAL geography group. I could see him being groomed as an advisory teacher from an early stage. Some of his (Tom's) initiatives were really quite novel; for instance taking sixth formers and teachers away for residential fieldwork in history and geography to Durham and the CAL geography group engaged in paired, mutual evaluation of teaching and software.

Again for this category (initiatives and policy) there are common elements. Both advisers arranged for and appointed an advisory teacher working closely alongside themselves and both displayed an innovative and progressive approach. They have also been clearly influential within the LEA in helping formulate policy and staffing. They both liaised effectively with senior LEA managers and exerted some influence on the latter.

Impact on CAL geography

The impact of Paul Gomer on CAL geography was indirectly through the support and contact with in particular Tom David and Saul Jacobs. In Tom David's case that influence was through his involvement with the heads of geography initiatives group and specifically the CAL geography group both mediated by his direct contact with Martin Moseley. A good deal of CAL geography INSET was thereby organised through the 1980s.

Views

Finally, again in common, both inspectors have wide ranging and firmly held views informed by contacts and networks beyond LEA1. They both are involved with, knowledgeable about and have strong views on MEP. In particular they are strong proponents of computers across the curriculum as opposed to curriculum studies, per se.

The final common element of both David and Gomer is that they were supportive of one another, liaised regularly and developed an undoubted mutually beneficial synergy. For instance the CAL geography group relied on Gomer for technical support and provision of the software.

Activity. Enabling and Constraining Factors Across the Portraits of Schools

Activity

By analysing school portraits (see appendices 5.3 to 5.9) it became clear that there was a great variation in levels of CAL activity in geography classrooms. By level of activity, I mean the extent of use of CAL software in geography classrooms. Closely related was the available and accessible hardware and software and the attendance by geography staff on INSET courses. Over the five to six year period of this study there were distinct trends in activity and a variety of common enabling and constraining factors were noticed. All this is shown in summary form in fig 5.14.

Levels of activity varied widely from School 1A, where there was minimal activity over six years, to school 1E where, apart from the last year or so, there was considerable activity across departmental staff and IT was clearly integrated within the geography curriculum. This is a very varied pattern of use given that LEA 1 (of the three LEA's studied) was the LEA with most CAL geography activity and the seven case study schools were amongst the most innovative in the LEA according to Mr David. Another generalisation across the schools is that there was not a lot of activity (use of software) and even in school 1E this was the case. In most cases (except 1E) where there was activity, this was dependent on one keen proponent of CAL. FARM and DEMOG were the most commonly used early programs. In some cases (1B and 1G) there was a good deal of software but it was infrequently used.

As to trends in levels of activity, between 1983 and 1989 no one school maintained consistently high level activity. Even activity in school 1E tailed off as new staff arrived and an established department broke up. The ups and downs of CAL activity did seem to closely correlate with the departure (IC, 1E) or arrival (1A, 1F) of particular members of staff.

Enabling Factors

Availability of computers was not in general a problem and the number of networks grew over the 5/6 year period. This contrasted with the generally held view of the time that lack of access to computers, especially in laboratories and

Fig.5.14 ACTIVITY, ENABLING AND CONSTRAINING FACTORS

SCHOOL	LEVEL OF ACTIVITY	TREND	ENABLING FACTORS	CONSTRAINING FACTORS
1A	Minimal	Some activity by 1989 but limited	No shortage of computers; young, keen, junior members of staff towards end of period	Negative perceptions of CAL; traditional geography courses; no clear school policy; rather anti LEA advisers.
1B	Steady use from early '80s (only HoD)	Still used but tailed off	Hod did MA on software evaluation; very knowledgeable and committed over many years; lot of software bought; strong and popular geography department	Great time needed; lack vision and policy from head; unable interest his colleagues in CAL; CAL across curriculum lacking.
1C	Considerable use from early '80s (only HoD)	Much use until HoD left in '88	Deputy head one of earliest users of CAL geography. MA on CAL geography. Helped produce software. No shortage of computers. Positive attitudes and knowledgeable re-CAL	Computer studies not CAL across curriculum; Neil failed to interest other colleagues. People not innovating - is IT worth it? In '85 Neil given up trying to persuade colleagues
1D	Minimal	Some use towards end '80s	Hod and former Hod had been on MA course; new HoD keen to move into CAL and bought range of programs; 1984 NZ teacher	2 key geography teachers had no great interest or knowledge re CAL. They have other priorities; lack of CAL across curriculum; lack promotion - staff not innovating
1E	Considerable use from early '80s (all geography staff)	Fall off in use as new staff take over	Key interaction between Saul, Paul, Tom and Head. Saul successful leader of united dept; he has had longstanding interest	Lost edge 85-89 as dept changed; morale low; new HoD not interested; innovation fatigue; loss of united innovative dept.
1 F	Limited use at start then noticeable increase by late '80s	Limited then a little by late '80s	No shortage of micros; Sara fully aware of developments; head keen on prestige computers bring	Old, conservative HoD; lack of united dept; morale low; lack IT across curriculum policy; time and booking micros a constraint;
1G	Limited use throughout	Some fall off in use	HoD did an MA and compiled software pack; informed and progressive; deputy HoD has worked with CALUSG and written programs	Lack of IT teacher with vision of IT across curriculum. Lack school policy; access to hardware a problem; 2nd in dept not active.

network rooms, was a major constraint. Only staff in schools 1D and 1F suggested it was a problem.

In total six interviewees in LEA1 had undertaken an MA in geographical education at a University School of Education, three of whom undertook it part time. All but Neil Pope (1978) undertook that course in the 1980's. Three had undertaken a dissertation which focussed on CAL geography. The payment of course fees was made by LEA1 and Mr David had clearly been influential in that. These MA courses raised awareness of the latest developments and possibilities. "I do value greatly the way it has opened up doors and got me out in various directions", said Mr Davies.

A key, and common enabling factor was the interest, commitment and expertise of one person in a department's geography staff. Several of such key individuals had regularly attended GA conferences and INSET and read the 'computer page' in Teaching Geography. Three had exceptionally longstanding experience in CAL geography. They were Mr Davies, Neil Pope and Saul Jacobs and these three were regular providers of local INSET on the innovation. The wider involvement of Neil (editing some early programs produced by the Computers in the Curriculum Project) and Martyn (compiler of the Learning Geography with Computers INSET Pack) had significant impact on the LEA. Finally, some newer members of staff in certain schools, towards the end of the study period, arrived at their respective schools and began to use CAL geography. This was true of 1A and a New Zealand teacher in school 1D.

Links between certain teachers both within and beyond schools developed a synergy which fed the commitment and enthusiasm of the partners. This was particularly true of professional links which Saul Jacobs made over several years with Tom David, Paul Gomer, his former headteacher and more recently with Martin Moseley. In fact Tom David and Paul Gomer bought hardware and software for Saul to use. Similarly Mr Davies had strong links with his previous head of department colleague and Sara Norris was undoubtedly influenced by her university tutor husband and her children who were keen on and expert in computing. This latter influence (children) was a common factor with Sara's other geography colleague and was mentioned by Mr Davies. The final important and mutually beneficial link was between Martin Moseley and Tom David. The latter early on identified Martin, as a leader of a head of department's group in the Borough and in particular as the leader of the CAL geography initiatives group.

Headteachers were also generally keen on the public relations advantages of claiming to have a supposed 'lead' in computers in the Borough and several features appeared in local papers about schools 1B and 1E. As the head of school 1B put it as quoted, in a local newspaper in 1985, "We regard ourselves as being in the forefront in computing developments". Though not generally especially well informed of developments in educational computing, heads saw it as a marketing ploy for attracting pupils in an increasingly competitive market.

Another positive factor that emerged but was not often mentioned was the interest computers generated in children. As Mr Davies put it, "CAL can generate a very, very much, greater interest in the overall topic". Similarly, Mrs Rolfe grudgingly admitted that "the students quite like it"(MORPH).

It seems that some software, particularly FARM and DEMOG was into schools early in the nineteen eighties and frequently used. Tony Lichfield also felt that there were "now (by the mid-eighties) much better programs on the market for geography".

Another enabling factor, though not mentioned by most teachers, was the power and encouragement of the Assistant Director of Education for the development of IT in schools in LEA 1. Inspectors were more aware of this major influence but it was also mentioned by Neil Pope.

I had expected that teamwork and a closely integrated department would assist in the incorporation of such an innovation but 'united' teams within departments were rare and only one (1E) was identified. In that case close working relationships clearly did encourage the spread of the use of CAL geography.

Constraining Factors.

Limitations of the software available were particularly stressed by Mrs Rolfe. For instance, 'I play the farm game but it's a bit limited' and 'I get the impression that things are still in the early stages and we need more people devising software for us'.

Much more common was the lack of a person in charge of educational computing who had a knowledge and vision for IT across the curriculum. Many were heads of computer studies and formerly physicists and mathematicians. They ran computer clubs and computer studies courses but were unwilling or unable to promote the use of IT across the curriculum. They also acted as

'gatekeepers' to the hardware facilities making it difficult to book rooms. As Neil Pope put it, 'the computer studies lady sees her brief really, as a computer studies person, who has been given, by the Borough this network for computers across the curriculum ... but she will not go out of her way to drag people in ... but the facility is available'. Several interviewees bemoaned the lack of a clear computers policy in the school and the lack of real understanding and /or involvement of the head. As Mr Davies put it 'no clear plans have been given, no-one seems to know what is being installed or when.' He argues his head 'does not know how much time, money, staffing, he should allocate towards CAL'. There was 'no feel for an overall plan or vision from the head.'

Looking at the views of interviewees on CAL geography using the attitudinal scale(see fig.5.12), the majority are positively inclined apart from Mrs Rolfe and Tony Lichfield. The latter two did seem to have limited knowledge and negative views on the innovations, which did not shift over the years. The unsuccessful course run in November 1982 seems to have had a dampening effect on the initiative generally and probably led to making some attitudes more negative. As Mr Davies explained, 'its certainly put off a large number of the.... you might say waverers. I don't think they would have bothered then'. It certainly didn't help the attendance at the subsequent meeting (Feb 1983).

Very common were the difficulties faced by relatively keen and knowledgeable 'enthusiasts' in spreading interest and activity to other members of their departments. This was true of Mr Davies, Neil Pope and Martin Moseley in spite of running in-house INSET experiences and offering encouragement. In particular, Mr Davies and Neil Pope were depressed, even a touch disillusioned by this lack of success. One wonders if the lack of departmental 'teams' (in their cases) compounded this constraint.

Several interviewees mentioned that it all took so much time and there were so many other calls on staff time. As Mr Davies remarked 'one of the biggest problems is the great amount of time needed and I have perhaps not given it enough time'. As Sara put it 'the time required to prepare for a CAL lesson is a major constraint'.

Other interests took up the time of Tony Lichfield (year head), and Ken Box (setting up a field studies centre) in school 1D.

Perhaps most pervasive as a constraining influence was the attitude of staff to innovation in this period. It was, apparently, to do with industrial action and

threatened redeployment and their effect on morale. There was a sceptical view as to the value of taking on an innovation. Promotion was problematic and some schools felt oppressed by incessant change. In relation to the latter, Saul Jacob spoke of the beginning of 'innovation fatigue' by 1989. Sara Norris spoke of the reluctance of her staff to take on new things. 'If you do that it will become custom and practice' seemed to be a common attitude in school 1F. In addition, in the same school 'curriculum development is still a bit of a dirty word, and there's no one in charge of curriculum development', (Sara).

In 1D ' people are not taking on initiatives/innovation.... they are asking if it is worthwhile ie the cost/benefit... particularly because of the blockage in promotion', (Tony Lichfield).

Loss of an enthusiast causes any build up of momentum to be lost, so Neil Pope's elevation to a headship, Martin Moseley's promotion to an adviser's position, Mr Davies' retirement and Saul Jacob's moving out of the HOD position all caused a stuttering of their respective initiatives. The break up of 1E's team was also significant.

Finally in some, but a minority, of cases there was difficulty in accessing the hardware. As Tony Lichfield explained ' getting at the equipment at the time you want to' is a major restraint and 'organising booking of the network room' was mentioned by Sara Norris.

The LEA throughout failed to impact strongly on most heads of department and in that sense was a neutral rather than a positive or negative influence on change.

Themes and sub-themes across schools.

The 'portrayal' of each of the seven geography departments, led to the identification of five themes. These were: The school environment; the department; the head of department; IT and geography; and beyond the school. Eighteen sub themes were identified from the study of the portraits. These are shown in appendices 5.12 to 5.16.

The next step was to take each sub theme and identify common and distinctive features across the schools. That is what now follows.

1 The School Environment

1A. *Head and curricula*

A consistent picture came through here. Heads saw computers as a source of status for their schools and several articles appeared in local newspapers identifying links between certain schools and computer companies and/or commenting on the lavish computer provision and developments in certain schools. It was seen by heads as a marketing weapon for their schools, particularly in an era when school rolls were declining. Heads did seem to see educational computing as a hardware priority not as a 'computers across the curriculum' priority. Most had a strong 'computer studies' vision and perspective. Heads of department, who were in general the interviewees, perceived a lack of clear policy direction on computers from top management.

1B *IT in the school*

Here there was a clear sense of a growing volume of hardware in each school and particularly networked rooms being set up. In spite of a number of LEA policy documents there was little evidence of written/formal policies about computing in schools or in geography departments. The clear emphasis was on computer studies directions rather than IT across the curriculum. No mentions were made of policies for software purchasing, storing or evaluating. Discussions with heads of department invariably revolved around available hardware.

1C *IT coordinator*

The impression given was of coordinators who had come particularly from maths and physics backgrounds and had shown some early interest in computers. This interest was 'rewarded' by being made head of computer studies. Major efforts were being made to set up computer studies courses at GCSE level and computer awareness courses in the lower secondary years. Those that had made an effort to encourage departments to use CAL were either ineffective or less than energetic in those efforts. There did seem to be a lot of movement of staff into and out of these positions.

1D Miscellaneous re-school

By the mid nineteen eighties there was a fall in school rolls in LEA1, such that two schools had to close and redeployment of teachers affected most schools. Tom David had this sensitive responsibility for teachers of history and geography for several years through the mid nineteen eighties. At the same time promotion was unlikely and industrial action about pay and conditions of work was common. All these circumstances led to a plummeting of morale between interviews held in 1983 and 1985. Staff became less interested in taking up new curriculum initiatives and attendance at INSET meetings was affected. For instance Saul Jacobs as an active member of NUT missed various CAL geography group meetings. As Sara Norris put it there was a 'massive impact of industrial action'.

2. The Department

2A Strength of department

These departments were strong in that Geography was especially popular at GCSE level, all being more popular than the numbers opting for GCSE history. They were staffed by between three and five fulltime geography staff, backed in many cases by senior teachers and deputy heads. 'A' level numbers were more varied but generally they were, in the context of their schools, middle ranking departments in that respect. The strength of the departments came as no surprise since that is why they had been selected for this research by Tom David.

2.B Staff

In the middle nineteen eighties several of the departments studied had enjoyed long periods of staff stability. By the 1989 interviews and questionnaires, two departments had experienced considerable turn around of their staff members. These were schools 1E and 1F.

2C Type of geography

A great variety of geography syllabuses were followed but if anything the majority taught more progressive courses such as Geography 16-19 'A' level and GYSL GCSE. Two longstanding heads of departments seemed to block change in schools 1A and 1F. As Sara Norris said of her head of department,

whom she subsequently replaced, he 'even considers aims and objectives unnecessary and little can be done until this gentleman retires.'

2.D Outside links

Clearly since his arrival at this LEA, Tom David had set up a range of initiatives to bring geography teachers, particularly HoDs, together. Generally interviewees were positive about these efforts. However the culture of this LEA was for schools to work in isolation and geography staff still felt isolated and attended few meetings with fellow geography teachers. In the 1989 interview with Martin Moseley he mentioned the serendipitous meeting he had with Saul Jacobs at which he learned about the latter's field work in Docklands. They met infrequently and this meeting was not planned. There was a widespread ignorance of the MEP, several regularly attended the annual GA Conferences and a couple attended the annual GYSL conferences. All mentioned the unsuccessful 1982 CAL geography meeting.

2.E Staff as a team

Overall there was a clear feeling that teamwork does not exist except for 1E which had lost its substantial cohesion by the late eighties through the loss of staff and a higher turnover than normal for them. In the other direction Sara was consciously building teamwork from a new group of staff recruited in the late nineteen eighties.

2F IT knowledge/expertise of staff

There was generally a patchy level of expertise in departments studied. If any it usually resided in one person. However that knowledge, understanding, enthusiasm and expertise was not successfully spread to other members of the department. The one exception was 1E where joint interest and expertise was evident through much of the decade. More recently in the late nineteen eighties there was a build up of expertise and attendance on courses by members of 1F's geography department.

3. Head Of Department

3A Professional background

There were several very experienced members of staff in the seven departments studied. For instance the HoD in 1F had been at the school for nearly 40 years; Mr Davies (1B) for 20 years; Tony Lichfield (1D) for 19 years; Mrs Rolfe (1A) 11 years; Martin Moseley (1G) for 9 years. Several were right at the end of their careers and did retire by the late nineteen eighties. These were Mr Davies, Mrs Rolfe, Tony Lichfield and the HoD of 1F. Seven interviewees had undertaken an MA in Geographical Education (see fig. 5.11) and several had a particular interest in CAL geography. Three undertook MA dissertation research which focused on CAL and Martin Moseley compiled the Learning Geography with Computers Pack published by MESU. In addition several of the departments studied had a number of senior school staff within them.

3B Management style/strategy

The most common management approach of the seven heads of department is mild mannered and gentle, apart from 1A. HoD's of 1B and 1C were both enthusiasts for CAL geography who tried, unsuccessfully, to persuade and lead by example. By the late nineteen eighties they had both, it seemed, given up trying. As Mr Davies said, 'There is no point in sending (information about CAL) to anyone else in the geography department here because they are not interested'. One wonders if the strong commitment and high level of expertise of Mr Davies and Neil Pope may have put off other members of staff? As to the management style of Saul Jacobs, he seemed to be a part of a team. 'It just happened', he argued, 'they're just interested.' However they were together a lot, talking a great deal and having built up trust. The most autocratic management style was that adopted by Mrs Rolfe but that was no more effective than the majority of others. She 'sent' members of her department to various INSET sessions on CAL geography but their feedback on such sessions tended to be negative.

3C Knowledge/attitudes to IT

Overall there was a good awareness of the availability of hardware and software in each school and most interviewees expressed positive attitudes to the role of IT in geography. Some had clear visions for the potential and future

of CAL geography. 'Yes, it's part of their world now and that's why I think it's important', suggested Sara. Geography has particular advantages for incorporating IT, argued Martin Moseley since it was 'much better equipped than almost any other subject'. There is a clear rhetoric-reality gap here, and this writer wonders if he was receiving a rehearsed set of positive attitudes to the innovation. Was this what the interviewees wished the interviewer to hear?

The minority had negative and outdated views. Tony Lichfield and Mrs Rolfe displayed those in their interviews.

The sources of all these viewpoints and attitudes were not clear but Sara Norris reckoned that in her's and a colleague's case they were influenced by the use made of computers by their husbands and children.

4. IT And Geography

4.A Level and nature of activity (see separate and earlier section).

4.B IT resources

Over the nineteen eighties a gradual increase in the availability of hardware and software was observed and neither seemed a major constraint on the uptake of the innovation. Many departments had the early CICI programmes and of those DEMOG and FARM were most mentioned. Neil Pope had helped edit these. Towards the end of the eighties all departments had the Learning Geography with Computers Pack compiled by Martin Moseley and bought by Tom David for departments attending the two and a half day 1989 INSET course.

4.C Plans/Policy re IT geography

I found no evidence of written down policies for geography and IT. No departments could verbalise a policy either, though 1E put ideas very much into practice. For instance it sold its original BBC micro in favour of using the 480Z laboratory then moved back to the use of BBCs for clearly justifiable reasons. Many hopes and aspirations were expressed at these interviews but there was a touch of embarrassment at the failure of action to match their intentions.

5. Beyond The School

5.A LEA

As was seen in 2D earlier, there has been a culture of schools working in isolation both from one another and from the LEA. However increasingly positive noises arose from discussions about the role of Tom David, the geography inspector. Mrs Rolfe was a clear exception to this. She stated that 'I don't think to be frank that I gain anything from the set up of an area adviser'. Even she grudgingly accepted that 'well probably in fact since Mr David came there's been more done here than any authority I've been in'. Tom Lichfield is inconsistent in the views he expresses. In 1984 he remarked that 'He is very nice. I wish we'd had him six or seven years ago'. Here he is contrasting Tom David with the previous post holder who was a generalist /humanities person. Yet in 1985 Tony suggested that he was 'not in schools enough, not as much personal contact, not enough direction from him,' ('Him' being Tom David).

The great majority of observations about Mr David are positive. 'He has been very good as our new inspector ... and there have been several useful meetings organised by him'. Saul Jacobs commended the LEA's inspectorate in general by remarking that 'this support for new initiatives plus keenness to take things on was because LEA1 wishes to be seen as an LEA at the leading edge of new curriculum initiatives'. 'Always very supportive in the background' Saul remarked about Tom David.

Sara Norris particularly liked the CAL geography group. 'I think it's an excellent idea. It was very good initially to get together and find out that all schools in the borough have similar problems of access to computers... brilliant really. That sort of thing must be done... a morale booster in terms of persisting really.' She felt that he (David) was 'very supportive and is very active but the Borough as a whole is not'. She saw the termly HoD meetings as 'a tremendous source of information and progress really.' Martin Moseley commented that 'he's not starchy' and felt he had a difficult job given the tradition of LEA1 schools working in isolation.

Paul Gomer is understandably more distant to geography teachers than Tom David. Interviewees liked the computer education support set up in the Borough which is, in no small degree, due to Paul's work. 'As far as the computing is concerned it's further ahead than many (other LEAs)' according to Tom Davies. 'I must say the Borough is probably one of the most progressive for a smaller Borough it has always been at the forefront of computers and it runs, a very big, computer gathering' said Neil. 'Basically it's given us a 'bank'

of where we can go to ... say, I want to have a look at that program... its given us an area where we can actually go and play around with the programs... you've got on-the-spot expertise there who can bail you out which is quite useful' said Tom Davies.

Few geography teachers know Paul directly though Tom Davies sees him as a computer studies person and Sara reckons he is 'someone who helps to acquire computers - no more'. Neil is very critical of Paul Gomer and his lack of encouragement of CAL across the curriculum. 'He is a computer man first'. Of all the interviewees Saul Jacobs knew Paul Gomer best and felt he was very committed to IT across the curriculum which is in total contrast to Neil's view!

Most interviewees had clear and negative opinions on the unsuccessful 1982 meeting. Neil Pope who ran the bulk of the meeting saw it like this. 'The first lot of MEP packs arrived, I was then asked to demonstrate it to people... and I was assured that it all had high resolution graphics and various things, and it didn't'.

Tom Davies reckoned it 'certainly put off a large number of the ... you might say waverers. I don't think they would have bothered then'. Speaking of the software demonstrated, even Saul suggested that 'it was the most uninspiring, stuff '. Martin Moseley was scathing. 'Oh it was so boring, it really was pretty desperate...I think... I think Neil Pope really was just not very well prepared and I think trying to run a meeting in that style is courting disaster'. Martin reckoned LEA1 had been set back considerably by such an unsuccessful event.

Probably a key but indirect influence on CAL geography in LEA1 was the deputy director of education who 'used to be the former science and maths inspector... was a very forceful character and he pushed it so that, at the early stages, it got off the ground' (Neil). He does seem to have been influential and not a man to cross! As Neil Pope put it, 'Oh yes, very dangerous. He will favour some people and put money into what he wants and that's how its developed'.

5B National developments

The interviewees, it seemed, had an above average awareness of various developments since most attended annual GA Conferences, read Teaching Geography and some had attended sessions held at a local GA branch. Most unusual, as mentioned earlier, was that seven had undertaken MAs in

Geographical Education, one had edited an early CIGP pack of programs and another compiled the Learning Geography with Computers pack.

However a minority of them had heard of, let alone knew anything about, the MEP.

The impact of the MA was remarked upon by many. Martin Moseley reckoned it made him, 'more optimistic and cheerful.. people had undermined my confidence'. Tom Davies spoke at length of the impact the course had on him.

'Its done a great deal, because it has taken me out of an unfortunate rut... and its given me a great deal of spiritual refreshment, it has given me a great deal of additional overview of the subject and the philosophy of the subject. Its really opened many doors, in terms of personal development, in terms of going places, meeting people and getting down to looking at the overall question of the CAL side of things, which I have as my particular interest. I do value greatly the way in which it has opened up doors and got me out in various directions'.

Matthew Johnson mentioned an IT geography session on this MA course

' I benefited enormously from the session on IT... it gave me the impetus to experiment at school and also to invest in my own PC... I feel that the whole ethos of computer education has changed'.

As Saul put it, 'I think it's very important to have a wider view, so that one can see CAL geography in a wider, educational context'.

The experience of the MA certainly widened horizons and perspectives and in one case (Martin Moseley) led to the ambition of moving into the advisory service. In other cases it probably partly led to new job opportunities. Saul and Neil are examples of that.

Chapter 6

Models and the Core Data

Having explored the extensive literature on innovation and change (Chapter 2), I had to determine which conceptual structures, models or theories would best help interpret this core data. Those I considered most appropriate and helpful are shown in fig. 6.1, categorised into three types. The first category of model classifies the actors in the change process; the second group is of models addressing the change process over time; and the third is a typology of innovation strategies.

Categorising Actors

Rogers (1983) devised five adopter categories.

"These are the classifications of members of a social system on the basis of innovativeness, the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system..... These five categories are ideal types, conceptualisations based on observations of reality and designed to make comparisons possible. Dominant attributes of each category are: innovators - venturesome; early adopters - respectable; early majority - deliberate; late majority - sceptical; and laggards - traditional," (Rogers, 1983, pp 268/9).

These categories are what Rogers calls 'ideal types' that is "conceptualisations based on observations of reality and designed to make comparisons possible.... ideal types are based on abstractions from empirical cases and are intended as a guide for theoretical formulations and empirical investigations," (p 248).

The following are the essences of Rogers five categories:

- * Innovators: eager to try new ideas; communication patterns and friendships among a clique of innovators are common; launches the new idea in the social system by importing the innovation from outside of the system's boundaries.
- * Early Adopters: a more integrated part of the local social system than are innovators; this category has the greatest degree of opinion leadership in most social systems; potential

Fig 6.1 Models of Innovation and Change

Categorising Actors

Adopter Categories	Rogers (1983)
Typology of Linking Roles	Havelock (1969)
Continuum of Teacher Sub-Cultures	Dalton (1988)
Leadership Styles	White and Lippitt (1968)
Attitude Classification	Chandra (1986)

Change over Time

Model of Stages in the Innovation - Decision Process	Rogers (1983)
Stage Theory	Yin (1979) Fullan(1991)

Strategies for Innovation

Change Strategies Model	Bennis, Benne and Chin (1969)
-------------------------	-------------------------------

- adopters look to early adopters for advice and information about the innovation.
- * Early Majority: these adopt new ideas just before the average member of a social system; they interact frequently with their peers, but seldom hold leadership positions; they follow with deliberate willingness in adopting innovations, but seldom lead.
 - * Late Majority: they adopt new ideas just after the average member of a social system; they approach innovations with a sceptical and cautious air; and tend not to adopt until most others in their social system have done so; they need the pressure of peers to motivate adoption.
 - * Laggards: they are the last in a social system to adopt an innovation and possess almost no opinion leadership; they are the most local in their outlook and many are near isolates in social networks; their point of reference is the past and they are suspicious of innovations and change agents.

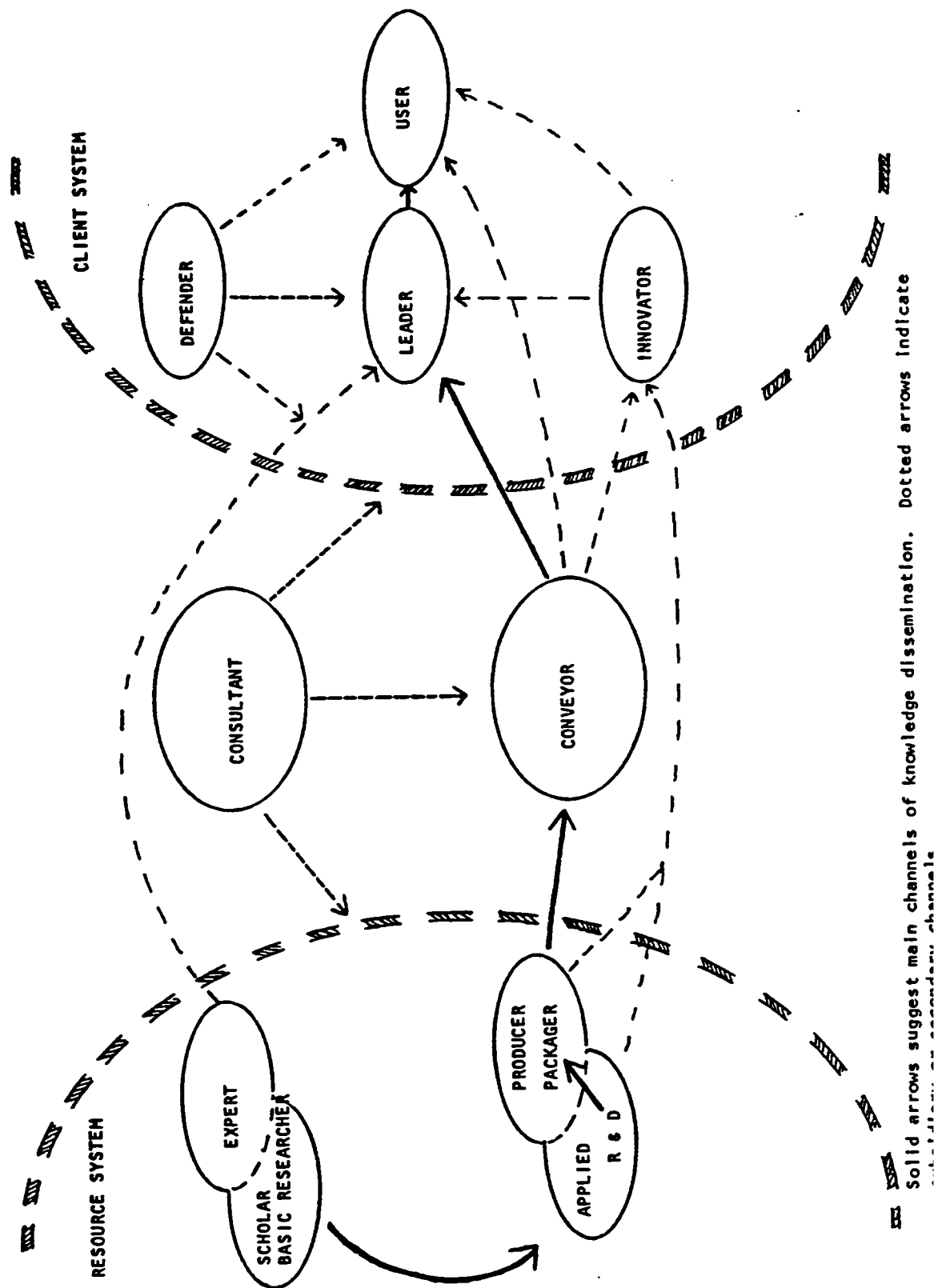
Applying these categories to the actors in LEA1, I made the following allocations:

*Innovators	Mr. Davies Neil Pope Saul Jacobs Sam Royce
*Early adopter	Matthew Johnson
*Early majority	Sara Norris
*Late majority	Tony Lichfield Ken Box Martin Moseley
*Laggards	Mrs. Rolfe Bob Thompson

Unlike the Roger's model, this distribution is far from normal since it is polarised both at the 'innovator' and 'laggard' extremes.

Havelock (1969) developed a typology of linking roles. "In offering this typology of linking roles we have tried to cover all the important functions which together, are needed to establish and maintain linkage between knowledge sources and resources on the one hand and users, consumers and clients on the other."
(p 7-21) Havelock shows the relationships among linking roles in fig. 6.2

Fig 6.2 Relationships Among Linking Roles [Havelock (1969)]



A shorthand version of this typology now follows:

- * Conveyor takes knowledge from an 'expert' source and passes it onto a potential user - not an expert
- * Consultant facilitator, helper, diagnoser of needs, objective observer
- * Trainer expert in a body of knowledge, 'transfer by instilling an understanding' (p 7-4)
- * Leader uses power or influence to create effective linkage 'by example or direction' (p 7-4)
- * Innovator first person to take up an idea in that system, 'transfer by initiating diffusion' (p 7-4)
- * Defender strong on reflection, 'sensitize user to pitfalls of innovations' (p 7-4a)

Three other types, knowledge builder, practitioner, user, are of less value for my purposes here where the key intention is to see how these 'types' 'fit' actors in schools.

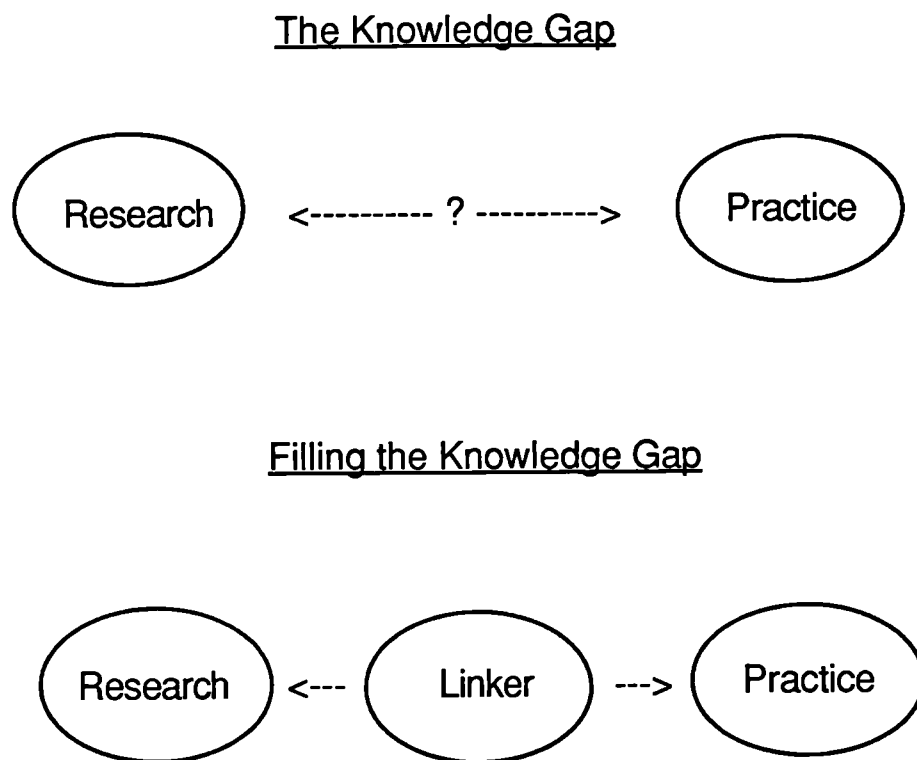
Havelock's typology is based upon what he calls the 'knowledge gap'. Research and practice (fig. 6.3) he sees as 'two social systems each defined and identified by its own set of rules, values, languages and communication patterns There is an inadequacy of shared values, common perceptions, and inter-system communication patterns. The linking role argument is that this gap can be bridged effectively if additional persons or groups are interposed between the two systems..... these intermediaries being specialists in the process of linking itself', (p 7-1).

Applying this typology to the actors in this study suggests the following:

- | | |
|--|--|
| Conveyor: | Tom David |
| Consultant: | Paul Gomer |
| Trainer (and partly Knowledge Builder) | Neil Pope |
| Leader: | Mr. Davies; Matthew Johnson; Saul Jacobs |
| Defender: | Martin Moseley; Sara Norris |

I suggest that Mrs. Rolfe, Ken Box, Tony Lichfield and Bob Thompson have no linking roles.

Figure 6.3: The Knowledge Gap and the Role of the Linker



Based on Havelock (1969)

Through study of teachers in two schools Dalton (1988, p 220) identified a continuum of teacher sub-cultures. One pole was 'radical' which was a process orientated approach using content as a resource and enquiry the major teaching strategy. The other pole he titled 'traditional' which was a product orientated approach with content as the end objective and instruction the teaching approach. Towards the middle of that continuum were 'liberal' or 'reformed' teachers. By implication Dalton suggested that 'liberal' or 'radical' teacher sub-cultures would be more willing to innovate than 'traditional'. Applying this classification to the teachers of LEA1, none seemed to be radical whereas Mr. Davies, Neil Pope, Matthew Johnson, Martin Moseley, Saul Jacobs, Sam Royce and Sara Norris were liberal. This left Mrs. Rolfe, Bob Thompson, Tony Lichfield and Ken Box classified as 'traditional'.

White and Lippitt (1968) applied three leadership styles to change agents. The details of these three styles are listed in fig. 6.4. These I found difficult to assign to teachers studied in LEA1. However I did feel that Mrs. Rolfe was autocratic; Mr. Davies, Neil Pope, and Martin Moseley were democratic; and Tony Lichfield, Ken Box and Bob Thompson were laissez-faire. Tom David the geography inspector I felt was democratic in White and Lippitt's sense.

Chandra (1986) developed an attitudinal classification of 8 categories based upon 7 earlier categories. The latter were: biographic data; initial contact with and attitude towards computers; self concept; attitude towards teaching in general; self concept related to computers; attitude towards computers in teaching. His eight categories were as follows:

- | | |
|-----------------|---|
| * Favourable | impressed and enthusiastic about computers |
| * Critical | positive but with several critical comments about the way they should be used or about associated hardware and software |
| * Worried | positive but with worries and fears |
| * Unfavourable | negative perceptions of computers |
| * Antagonistic | felt insecure, very afraid of or against computers |
| * Uninitiated | did not have any real perception or idea about use of computers in school and in teaching |
| * Not-mentioned | no mention of opinions concerning computers |

I assigned a category to each of the seven teachers interviewed in LEA1 by studying carefully their responses to the questionnaire (fig 5.12) which formed the basis for our first interview. My categorisation and shorthand justifications

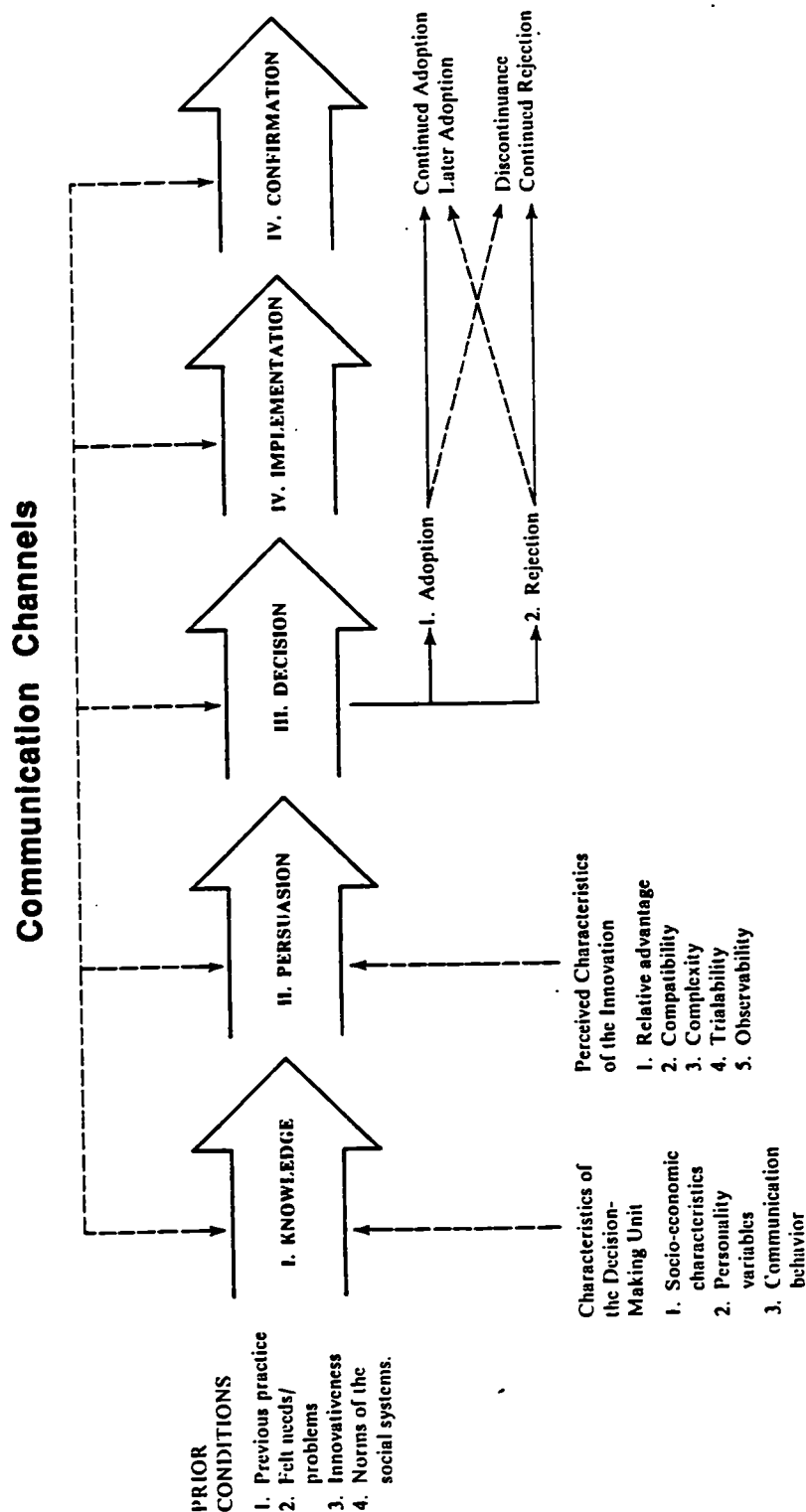
Fig 6.4 Characteristics of Leadership Styles [White and Lippitt (1968)]

AUTOCRATIC	DEMOCRATIC	LAISSEZ-FAIRE
<p>1. All determination of policy by the leader.</p> <p>2. Techniques and activity steps dictated by the authority, one at time, so that future steps were always uncertain to a large degree.</p> <p>3. The leader usually dictates the particular work task and work companion of each member.</p> <p>4. The dominator/leader tended to be "personal" in his praise and criticism of the work of each member; remained aloof from active group participation except when demonstrating.</p>	<p>1. All policies a matter of group discussion and decision, encouraged and assisted by the leader.</p> <p>2. Activity perspective gained during discussion period. General steps to group goal sketched, and when technical advice was needed, the leader suggested two or more alternative procedures from which choice could be made.</p> <p>3. The members are free to work with whomever they chose, and the division of tasks was left up to the group.</p> <p>4. The leader was "objective" or "fact-minded" in his praise and criticism, and tried to be a regular group member in spirit without doing too much of the work.</p>	<p>1. Complete freedom for group or individual decision, with a minimum of leader participation.</p> <p>2. Various materials supplied by the leader, who made it clear that he would supply information when asked. He took no other part in work discussion.</p> <p>3. Complete non-participation of the leader.</p> <p>4. Infrequent spontaneous comments on member activities unless questioned, and no attempt to appraise or regulate the course of events.</p>
LEADERSHIP STYLES AND GROUP BEHAVIOUR UNDER THESE STYLES		
<p>1. Can create much hostility and aggression (for example, aggressive demands for attention, destruction of property), including aggression against scapegoats (i.e. concentration or polarisation of group aggression against a single "innocent" object or person).</p> <p>2. Can create discontent that does not appear on the surface. This can create a certain amount of "subdued atmosphere where spirits are damped down and group kept soberly at work; "comradeship" as they recognise themselves as being in the "same boat".</p> <p>3. More dependance and less individuality.</p>	<p>1. More efficient than autocratic and laissez-faire (in terms of achieving "work" and "social" goals).</p> <p>2. More interest and motivation shown in work - kept on working when leader left.</p> <p>3. Higher level of originality or creative thinking.</p> <p>4. More group mindedness, friendliness and mutual praise.</p>	<p>1. Less organised (they played more), less efficient (less work done and poorer work); less satisfying.</p> <p>2. More characterised by play.</p> <p>3. Group preferred democratic leader.</p>

Figure 6.5 Chandra's Categories Applied

Martin Moseley (Critical/Favourable?)	Very positive and informed re CAL geography
Sara Norris (Critical)	Positive but sprinkling of negative attitudes Critical of programs' quality Too much teacher time involved.
Saul Jacobs (Critical)	Negative re quality of software Negative re teacher time needed Not enough help Overall very positive.
Mrs Rolfe (Unfavourable)	Negative - not enough micros, low quality programs 'limited educational value' Mixed up attitudes CAL does not motivate Some elements are positive.
Neil Pope (Critical verging on favourable)	Very positive but not entirely so e.g. indifferent re quality of programs and limited educational value.
Mr Davies (Critical)	Negative re problems and not enough micros and high quality programs CAL geography 'Should be low priority'. Strange mixture of attitudes.
Tony Lichfield (Unfavourable)	Too many problems Indifferent re quality of programs Main value he sees as statistical analysis Generally negative and not well informed.

Fig 6.6 A Model of Stages in the Innovation-Decision Process



The *innovation-decision process* is the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision.

Note that for the sake of simplicity we have not shown the consequences of the innovation in this diagram.

Source: Rogers (1983)

for that are shown on fig 6.5. As can be seen most are 'critical' using Chandra's terminology.

Change Over Time

Rogers (1983) developed a model of stages in the innovation-decision process, (see fig 6.6). That is 'the process through which an individual (or other decision-making unit) from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision,' (p 165).

Applying this model to individual actors and developments studied in LEA1 gave me the pattern shown in fig 6.7. As can be seen most departments are at a different stage in the model from the key actor, usually the head of department. Also the model fails to take into account changes that regress i.e. those departments that become inactive and revert from (say) the implementation stage to the persuasion stage. Department 1E reflects such changes over time.

Fullan (1991) presents an initiation-outcome model (see fig 6.8) which is very similar to the model proposed by Yin in 1979. In the latter case the stages were: Initiation and Adoption; Implementation; and Routinisation. In Fullan's model phase one, initiation (mobilisation or adoption) are the processes that lead up to a decision to adopt and proceed with the change. Phase two, implementation (initial use) is about the first experiences (the first two or three years) of attempting to put an idea or reform into practice. Phase three, continuation (incorporation, routinisation, institutionalisation) is when change gets built in as an ongoing part of a system or disappears either by decision or attrition. Phase four is the outcome of the change process.

Applying Fullan's model to actors and departments in LEA1 led me to the following categorisations:

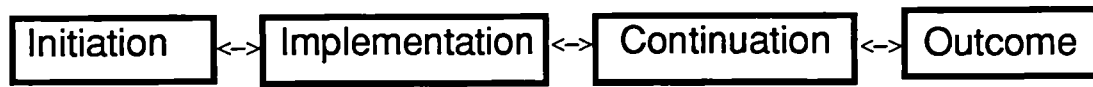
Actor		Department	
Mrs. Rolfe	Pre Phase 1	1A	Pre Phase 1
Mr. Davies	Phase 3	1B	Phase 1
Neil Pope	Phase 3	1C	Phase 1
Tony Lichfield	Pre Phase 1	1D	Phase 1
Saul Jacobs	Phase 3	1E	Phase 3
Sara Norris	Just Phase 2	1F	Phase 1
Martin Moseley	Phase 1	1G	Phase 1 almost 2

Again actors and departments are out of phase.

Fig 6.7 Applying Roger's Innovation/Decision Process Model

(INDIVIDUAL)	(UNIT/GROUP)
ACTOR	DEPARTMENT
Mrs Rolfe Decision (Stage III) 2. Rejection then continued rejection	1 A Decision (Stage III) 2. Rejection then continued rejection
Mr Davies Confirmation (Stage IV)	1 B Decision (Stage III) 2. Rejection then continued rejection
Neil Pope Confirmation (Stage IV)	1 C Decision (Stage III) 2. Rejection then continued rejection
Tony Lichfield Knowledge (Stage 1)	1 D Knowledge (Stage 1)
Saul Jacobs Confirmation (Stage IV)	1 E Confirmation (Stage IV)
Sara Norris Persuasion (Stage II) Bob Thompson Knowledge (Stage 1)	1 F Knowledge (Stage 1)
Martin Moseley Decision (Stage III)	1 G Decision (III)/Implementation (IV)

Figure 6.8: Fullan's Simplified Model of the Change Process



Strategies for Innovation

Bennis, Benne and Chin (1969) developed a typology of innovation strategies. They proposed three categories of strategy.

- A Power-coercive strategies depend upon access to political, legal, administrative and economic resources. Typically involve use of legal or administrative power.
- B Empirical-rational strategies assume that men(sic) are reasonable and will respond best to rational explanation and demonstration - use of education, training and publications to disseminate knowledge and research findings.
- C Normative-re-educative strategies assume that effective innovation requires a change of attitudes, relationships, values and skills i.e.. change within client system. Typically involves consultant/change agent.

This model can be applied to two elements of the data for LEA1. On the one hand Mr. Davies and Neil Pope undertook strategy B without success yet on the other hand Saul Jacobs led a cohesive departmental team which engaged in normative - re-educative strategies which were effective. Furthermore it can be argued that Tom David with the support of Paul Gomer (and later in the nineteen eighties from Martin Moseley and Arthur Sterling) adopted strategy B which only became effective towards the later nineteen eighties partly because earlier meetings had proved less than successful.

New Models and Frameworks Based on the Data

Having interpreted the data for LEA1 through existing models, I then had to develop other ways of modelling and framing the data. I first considered ways of categorising the actors who were interviewed. To do that I needed to identify specific dimensions which recurred either in a negative or positive direction for individual interviewees. The following six dimensions, with their adjectival opposites, were what I identified.

Positive Pole	Dimension	Negative Pole
Active	Activity	Inactive
Part of group	Personality	Solitary
Positive	Attitude	Negative
Knowledgeable	Knowledge	Ignorant
Innovative	Openness to change	Conservative
Powerful	Influence/Power	Powerless

The 'activity' dimension was a measure of the extent to which the actor was 'active' in the use of CAL geography. 'Personality' became a shorthand term to describe the extent of a person's willingness and ability to work in a departmental group (or not!). 'Attitude' was a measure of attitude towards the innovation and 'knowledge' was an indication of sophistication in terms of both knowledge and skills to do with CAL geography. 'Openness to change' speaks for itself and 'influence/power' is a measure of the extent to which an actor is able to bring this factor to bear on immediate (in this case geography) colleagues.

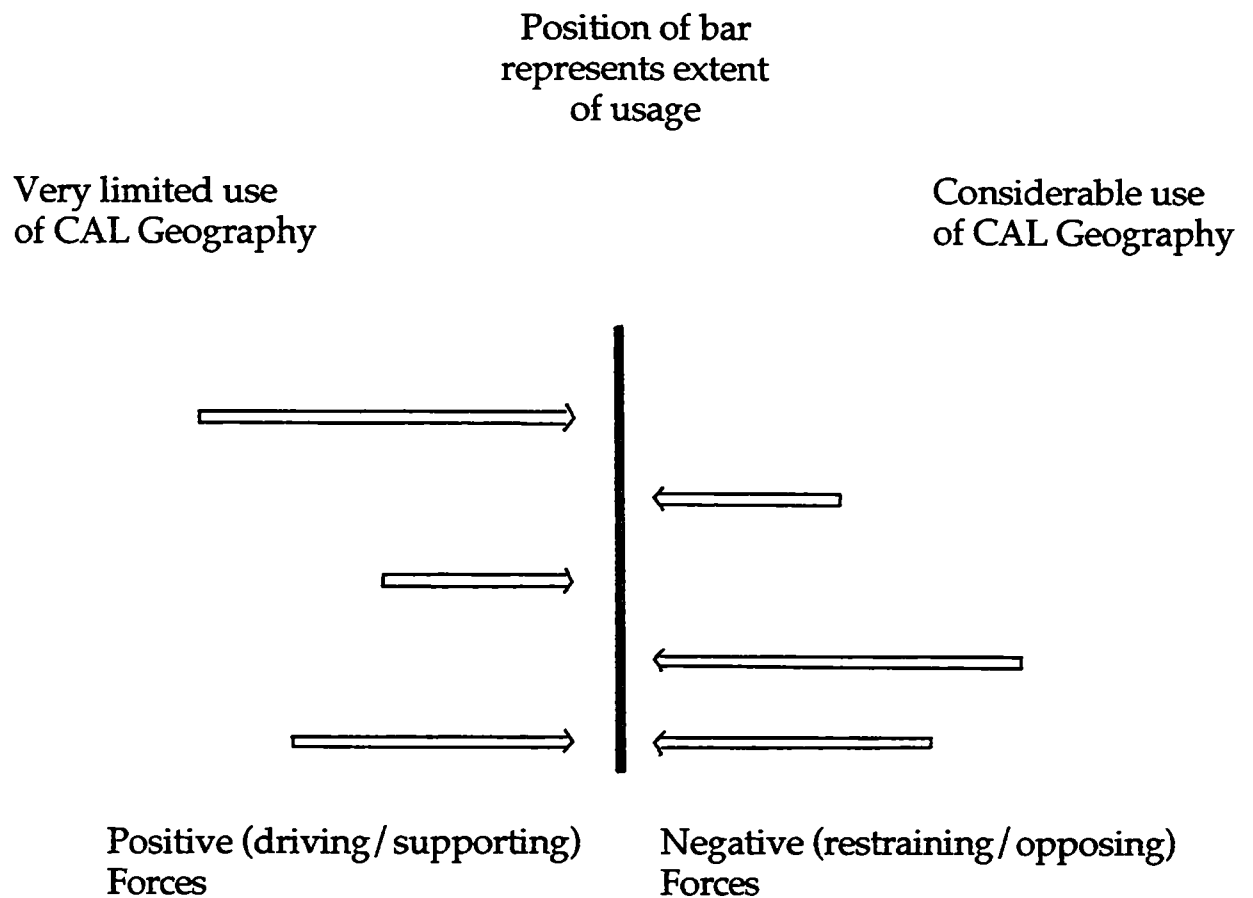
Considering these dimensions I classified the seven actors into four groupings. The first and vital distinction was between active and inactive and then the other adjectival opposites could be allocated to one of four categories of actors (see fig 6.9). 'Solitary innovators' were distinguished particularly by their inability to persuade (convince their colleagues to innovate) and by their relatively solitary role within the department. 'Influential innovators' of whom Saul Jacobs was the sole representative were distinguished by ability and willingness to work in a team and to successfully influence colleagues to innovate. Of the inactive categories, 'aspiring innovators' were distinguished from 'solitary reactionaries' by their knowledge, positive attitudes and innovative approach.

The most helpful of existing models that focus on change over time is one based upon Lewin (1952) and adapted by Chandra (1986). Lewin in his force-field model saw behaviour in an institutional setting as a balance of forces working in opposite directions. Such opposite forces can be regarded as forces hindering or promoting the use of an innovation at various levels. Change, he argues, takes place when the forces on one side (the restraining forces) are less than the other (the driving forces) i.e. there is an imbalance of forces. Such imbalance 'unfreezes' the status quo and movement (or change) takes

Figure 6.9: A Model for Grouping the Interviewees

ACTIVE		INACTIVE	
<u>Solitary Innovator</u>		<u>Solitary Reactionary</u>	
Solitary Innovative Powerless Positive Knowledgeable		Solitary Negative Ignorant Powerless Conservative	
<u>Influential Innovator</u>		<u>Aspiring Innovator</u>	
Team Member Powerful Knowledgeable Innovative Positive		Knowledgeable Positive Innovative Powerless	
Solitary innovators:	Tom Davies	Neil Pope	
Influential innovator:	Saul Jacobs		
Aspiring innovators:	Sara Norris	Martin Moseley	
Solitary reactionaries:	Mrs. Rolfe	Tony Lichfield	

Figure 6.10: Force-Field Model Based on Lewin (1952)



- * Length of arrow is proportional to magnitude/ strength of force.
- * Each arrow represents a particular force (negative or positive).

place. An imbalance may occur through a change in magnitude, a change of direction of any one force or through the introduction of a new force. The process of change consists of three main phases - unfreezing, moving and refreezing. Unfreezing occurs when the possibility of change is created; moving occurs when there is continuous disequilibrium; refreezing occurs when the balance is created around a new equilibrium.

I decided that such 'force fields' can be used to represent forces determining the extent of usage of an innovation. Thus a department's use of the CAL geography innovation can be modelled alongside driving (positive) and opposing (negative) forces (see fig 6.10). This is a diagrammatic representation of Lewin's conceptual ideas and takes Chandra's version further. This has been done for each of the seven departments studied and in each case a force field is drawn for 1983, 1985 and 1989 to show the direction of the change and the changing nature of the forces at work, (see figs 6.11-6.17).

I decided that another way to plot changes in activity over time is to graph that activity as line graphs for each of the seven departments. This I have done in fig 6.18 and by doing so I derived four categories of department as is also shown on the diagram. Schools 1A, 1F and 1D are in the majority and engage in a low level of activity in the first few years of the study, but with some identifiable but not considerable activity by 1989. 1B and 1E show increasing levels of activity until 1985 when a decline sets in. 1G displays a low level of activity throughout and 1C a declining level of activity. Data was not available for those two beyond 1985.

I now developed a descriptive model based on the key influences on decisions taken by interviewees and departments determining whether the innovation would be taken up or not. In particular I began to focus on 'actors' and 'environments' and their role in the decision making process. I had already made an effort at tabulating activity, enabling and constraining factors in fig 5.15. I now developed a more detailed picture of relevant actors and environments. This is shown in tabular form in fig 6.19. Breaking down 'environments' and 'actors' into more specific subsets was the next stage (figs 6.20 and 6.21).

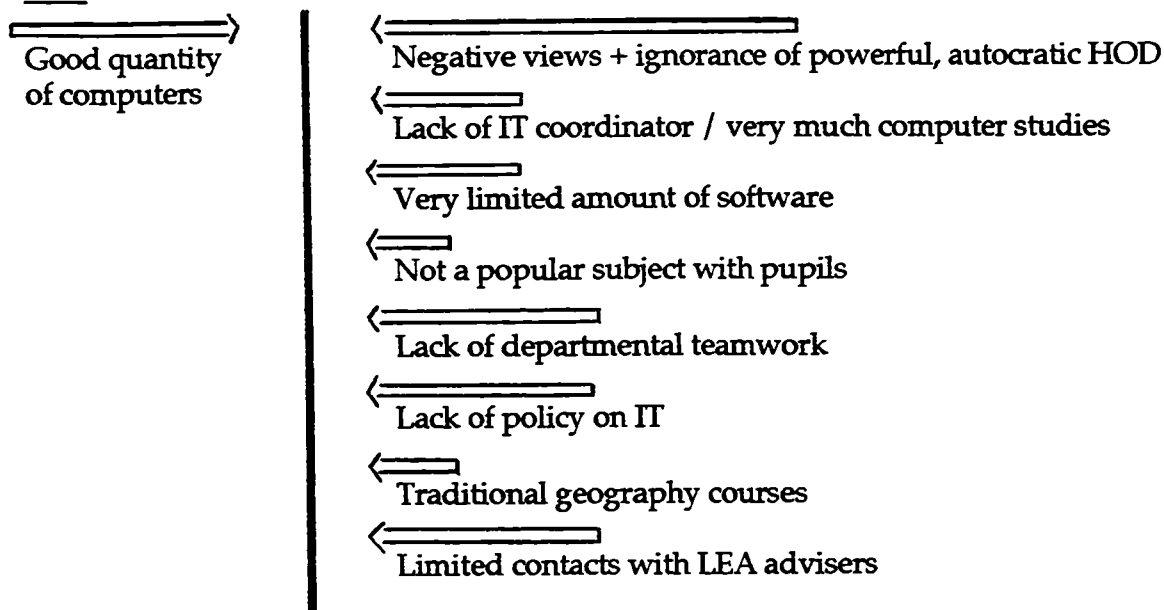
I then considered subsets of three of the levels in which teachers work (department, school and LEA). I looked for each department at a time (fig 6.22) at particular elements that influenced activity and did the same for the school

Figure 6.11: Force Field Model of School 1A

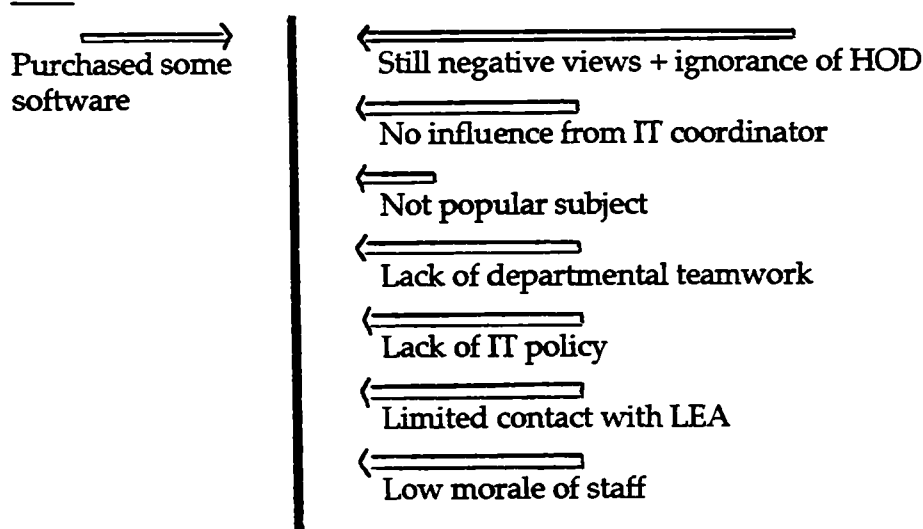
Very limited use
of CAL Geography

Considerable use
of CAL Geography

1983



1985



1989

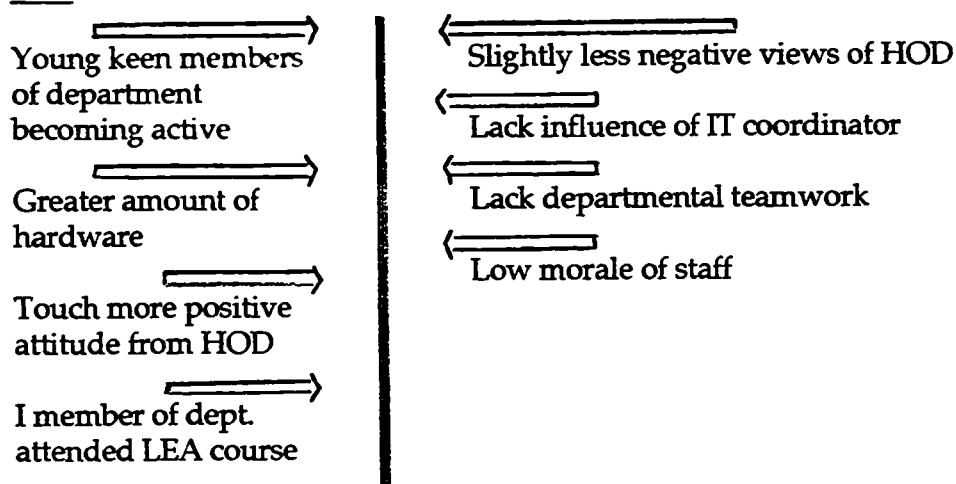


Figure 6.12: Force Field Model of School 1B

Very limited use
of CAL Geography

Considerable use
of CAL Geography

1983

Longstanding interest/
expertise of HOD

Lot of early software

Geography a popular subject

Strong links with Mr. David

Lack of vision, policy from head

IT across curriculum policy missing

No evidence of departmental teamwork

Access to micros limited

Colleagues not active/persuaded

1985

HOD refreshed after MA

Geography popular subject

More software purchased

Falling school rolls and loss of staff

Access to micros become worse

Still lack of vision, policy from head

IT coordinator not proactive

Geography staff not active in CAL geography

1989

New departmental
computer + Nimbus
laboratory

Great deal of extra
software

Mr. Davies took part
in 1989 LEA course

HOD losing heart/enthusiasm; now head of lower sixth

IT coordinator not proactive

Head lacks of vision re IT

Lack of departmental teamwork

Geography staff not active in CAL geography

Figure 6.13: Force Field Model of School 1C

Very limited use
of CAL Geography

Considerable use
of CAL Geography

1983

Longstanding expertise commitment
of Neil, senior member of staff

No shortage of hardware

Popular subject in school

Good deal of software

Computer studies not IT across curriculum

Other geography colleagues not persuaded,
inactive

1985

Neil begun to give up trying
to persuade colleagues

Geography continues to grow
in popularity

Even more hardware available

Head has limited awareness/ understanding

Neil has less time for geography now

Staff disappointed by quality of software, not persuaded
of CALs advantages

Blockage in promotions therefore not involved with
innovation

Paul Gomer perceived as a negative influence

1989

No data - Neil Pope has left school 1C

Figure 6.14: Force Field Model of School 1D

Very limited use
of CAL Geography

Considerable use
of CAL Geography

1983

Hardware not an
obvious problem
School had early
lead through Gomer

HOD and Tony had no great interest or knowledge
Inertia through too much staff stability?
Geography as a subject in decline
Lack of united, fulltime team of geographers
Persons i/c computers have been computer studies people
Geography staff do not attend INSET courses

1985

Young NZ teacher
is positive
Ken and Tony
attend some LEA
meetings

Fall in rolls, loss of staff, low morale of staff
Software available considered poor
Computer studies dominates

1989

New HOD keen to
introduce CAL
Good deal of software
bought
Hardware situation
much improved

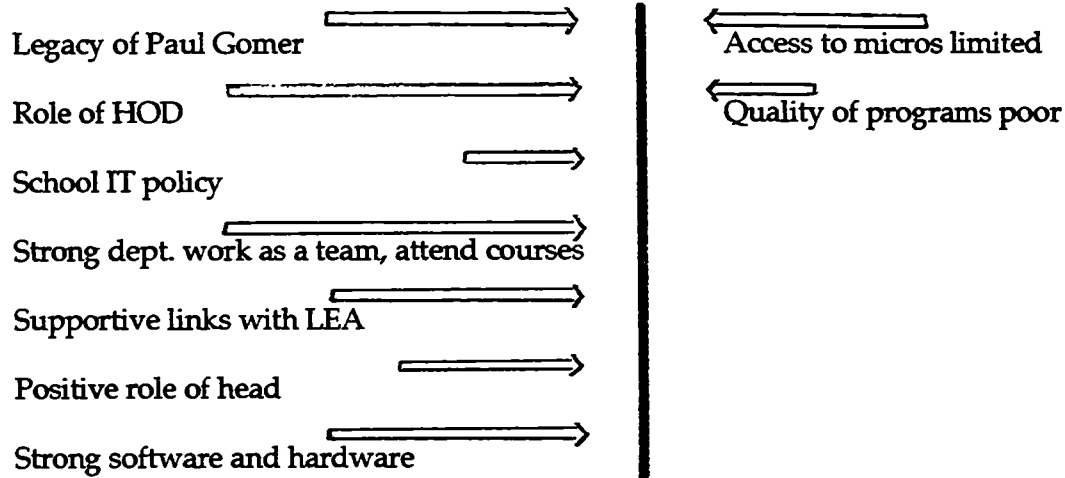
Loss of geography staff due to falling school roll
Two colleagues suffer from 'techno-fear'
Staff morale still low

Figure 6.15: Force Field Model of School 1E

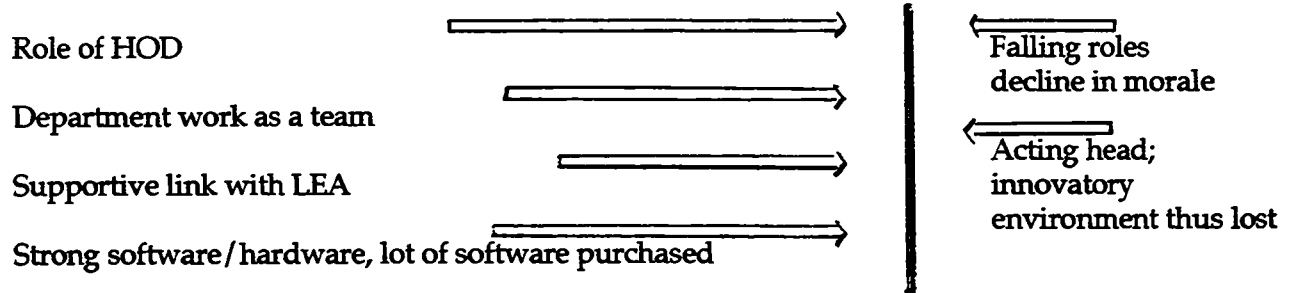
Very limited use
of CAL Geography

Considerable use
of CAL Geography

1983



1985



1989

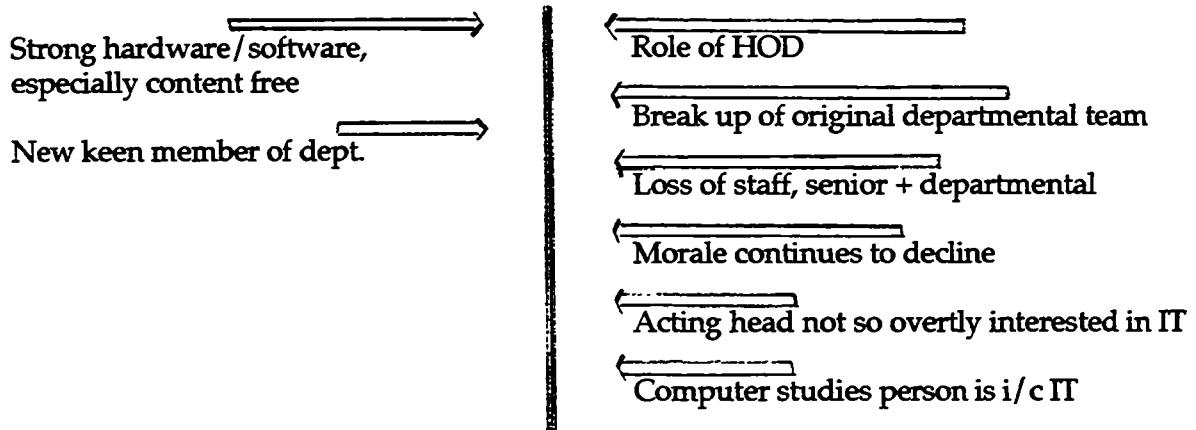


Figure 6.16: Force Field Model of School 1F

Very limited use
of CAL Geography

Considerable use
of CAL Geography

1983

→ No shortage of micros

→ Sara Norris fully aware
of developments

→ Head keen on prestige
computers bring

→ Some early software

← Bob Thompson very conservative influence

← Lack of team work

← Isolated from rest of schools

← Old fashioned curriculum + resources

← Lack of school-wide policy on IT

1985

→ Sara Norris + awareness

→ Beginning of new
departmental team

→ Superficial support of
head for computers

← Morale falling, staff insecurity

← Lack of IT across curriculum policy

← Booking micros becoming problematic

← Rather old fashioned curriculum and resources

← Head of computer studies weak communicator

1989

→ New enthusiastic staff

→ Subject becoming more popular

→ Better availability of hardware

→ Considerable amount of software
purchased

→ Geography staff have
attended a variety of courses

← Time required to plan a CAL lesson

← Isolationist culture of school

Figure 6.17: Force Field Model of School 1G

Very limited use
of CAL Geography

Considerable use
of CAL Geography

1983

83/84 HOD on MA
course + aware of geog.
developments

Strong links with Tom
David

Deputy HOD has
experience of CAL

Some early software

Lack of school policy for IT across curriculum

Access to hardware a problem

Lack of continuity with staffing

Rhetoric not matched by reality ie HOD

1985

Continued links between
HOD and Tom David

Martin i/c CAL geog.
group in LEA

Lack of continuity of staffing

Sally Low i/c CAL geography but little progress

Head of computer studies a 'gatekeeper' re access to computers

Lack of IT across curriculum policy

1989

No data since Martin has become advisory teacher in LEA1.

Figure 6.18: Trends in Activity - School by School

- 1A / 1F / 1D = Low level activity. Some increase by 1989.
 1B / 1E = Increasing activity until 1985, then decline.
 1G = Low level activity throughout.
 1C = Decline in activity.

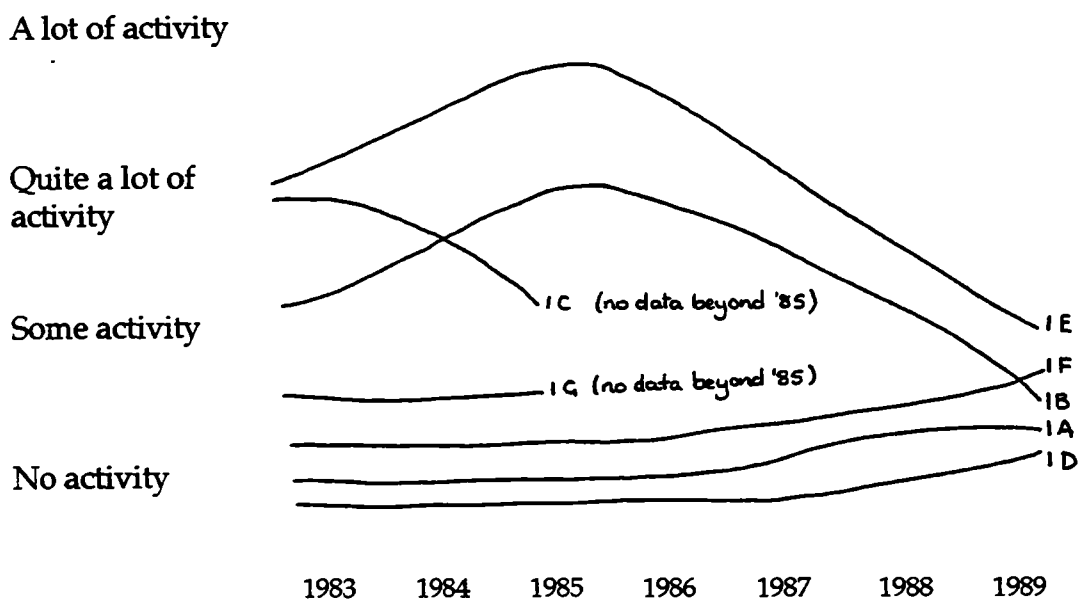


Fig. 6.19 Actors and environments across the seven schools

Schools	Activity	Actors				Environments				other
		Interview	Colleagues	IT Coordinator/Headteacher	Advisers	Dept	School	LEA	Wider	
A	1 farm game otherwise none	Conservative preconceived ideas. Negative attitudes. Ignorant, narrow view of IT	No evidence of interest/expertise except deputy head	Head of physics not a facilitator	Negative re Tom David	Not especially strong dept	No IT policy. Low morale of staff	Attends local GA meetings	GA Conference	Hierarchical management strategy. Delinquent laggard
B	Done quite a lot - just HoD though	Longstanding interest in IT. Influence of now departed colleague. Clear view of constraints	Well qualified geography staff - but no interest in spite of 1 day INSET Mr. Davies ran		Positive re David of previous adviser	Strong and popular dept. Good deal of software bought	No obvious policy. Head not directive; but keen to push achievements re hardware. Computer studies - strong	Very much involved in geography teachers meetings	GA conference and aware of MEP	Role of MA. Encouragement of colleagues a management strategy. About to retire. Frustrated by lack of progress. Not an inspiring man.
C	Considerable amount use - but only person	Longstanding interest and vision. Uses computers for administration. Disappointed by lack of interest by colleagues	Limited mention/action.	Neil tried to influence him (ie head)	Anti view of Gomer. More strong directives wanted	Strong dept	Has been influential on school IT policy without success. IT person is a computer studies lady	Member of LEA computer group. Clear knowledge of history of IT in LEA	Strong links with CIPC. clear role of MEP	Now left for headship. MA in 1978!
D	No action	Was HoD now housemaster. Ignorant and negative re CAL. 1989 or so has retired	Ken Box as HoD very engaged in FS centre. Young NZ teacher failed to inspire geographers. Young man has become HoD in 1989 - seems keen	Science and Technology pushed a lot. Head IT mainly electronics computers per se	Thinks David not as good as previous man	Strong but has been stronger	Falling rolls having big impact. Morale = problem and loss of staff	No great influence or involvement in LEA activities		MAs taken by Tony Lichfield and Ken Box. Staff don't seem attend LEA courses - yes, more recently Problem of CD in times poor morale

Fig. 6.19 (continued)

E	Active across members of dept. Quite a lot of software	Initiatives early on by asking LEA for a micro. 'Progressive and active' Use of 'crafty' tactic for own ends	Links with Gomer--- two-way link. All attended a good number of CAL courses	Gomer- genuine effort to bring about IT/curriculum Head big innovator and IT part of that	'Used' LEA when needed	Popular subject, strong stable staff	Clear policy re CAL across curriculum. Encouragement for CD. But morale, problems beginning -- 'innovation fatigue'	No strong influences except Gomer	GYSJ and GA conferences. Takes Educational Computing. Reads TG	MA 1987 on CAL. Contacted me about CAL early on
F	Some use but limited - getting more with new young staff	Well informed and progressive. IT one of many priorities	Blockage of former HoD. Not a 'team'. Reluctance to take on extra work	CS man not good communicator. nor interacted in CAL across curriculum Change for worse here. Was a AP/T job	Pleased with CAL geography initiative. Positive re David	Insecurity of redeployment a problem. Old fashioned			GA conferences and husbands influence	Role of 'home' influences. Wider environments against CAL
G	Limited action in spite of interest	Took initiative by writing adviser and given job of coordinating LEA group. Disappointed by lack action by colleagues	FARM program and colleagues/CALUSG. Sara put I/C CAL Geog but not effective. Variety courses attended by staff	IT Coordinator very much CS with whom Martin has clashed. Lack direction from Head	Positive and strong links	Very strong dept. Well established, well developed, geography curriculum	No policy developed	Strong links		MA 1984 INSET pack. Became AT and urban studies centre warden

AT=Advisory Teacher
CS=Computer Studies
CICP=Computers in Curriculum Project

FIGURE 6.20

ENVIRONMENTS: INFLUENCES ON ACTIVITY

(Based on LEA 1)

	'Active' Teachers			'Inactive' Teachers			
	Davies	Jacobs	Pope	Rolfe	Lichfield	Moseley	Norris
Department	-	+/-	-	-	-	+	-/+
School	-	+	-	-	-	-	-
LEA	+	+	+	-	-	+	+
'Climate' of '80s (Morale/insecurity)	?	?	?	?	-	?	-
MEP/MESU	+	?	+	?	?	+	?
RIC	?	+	?	?	?	?	?
TVEI	?	?	?	?	?	?	?
GA	+	+	+	+	+	+	+
DES	?	?	?	?	?	?	?

+ Positive
 - Negative
 ? Uncertain/unclear
 +/- Change over time

FIGURE 6.21

ACTORS: INFLUENCE ON ACTIVITY

(Based on LEA1)

		'Active' Teachers			'Inactive' Teachers			
Actors		Davies	Jacobs	Pope	Rolfe	Lichfield	Moseley	Norris
Other geography teachers	I N S C H O O L	-	+	-	-	-	+	+
Head of Department		N/A	N/A	N/A	N/A	-	N/A	-
IT Co-ordinators		-	+	?	?	?	?	-
Head		-	+	?	-	?	?	-
Other geography teachers	I N L E A	+	+	?	-	-	+	+
Geography adviser		+	+	+	-	+	+	+
IT Adviser		+	+	-	?	?	+	+
Director of Education		?	?	?	?	?	?	?
HMI	W I D E R	?	?	?	?	?	?	?
RIC Director		?	?	+	?	?	?	?

+ Positive
 - Negative
 ? Uncertain/unclear

FIGURE 6.22

INFLUENCES AT THE DEPARTMENTAL LEVEL

(Based on LEA 1)

DEPARTMENT	SCHOOLS						
	A	B	C	D	E	F	G
Strength							
• No. of students	√	√	√	√	√	√	√
• Image/status in school	?	√	√	√	√	√	√
Staff							
• No. of staff	√	√	√	√	√	√	√
• Stability of staff	√	√	√	√	√	?	√
• Morale	√	√	√	√	√	?	√
• Act as team	?	?	?	?	√	x/√	√
• Knowledge of IT	x	?	?	√	√	?	?√
• Alternatives to IT	x	x	?	?	√	?	?√
• Geography/geog education qualifications	?	?	?	√	?	?	?
Resources							
• Hardware	x	√	√	√	√	√	√
• Software	x	?	√	?	√	?	√
Curriculum							
• 'Progressive'	x	?	?	?	√	?	√
• Ease of change	x	?	?	?	√	x/√	√
• Initiative	x	√	√	?	√	x/√	√
• Policy	x	?	?	x	√	x/√	√
• HoD's Management	x	?	?	x	√	x/√	√
Linkages/Networks							
With IT colleagues	x	√	√	?	√	x	x
With IT adviser	x	?	√	x	√	?	√
With geography adviser	?	√	?	x	√	√	√
Activity							
Considerable across staff	x	?	?	x	√	x	?

x Not an influence
 √ Positive influence
 ? Uncertain/unclear
 x/√ Change over time

'level' (fig 6.23). The influences of the LEA are listed in fig 6.24 and are in effect a considerable range of potentially positive factors. However all seven interviewees had different perceptions of and indeed knowledge about LEA advisers.

Further analysis of the data showed me that the seven interviewees were differentially influenced by this great range of factors at a variety of levels. Their personal circumstances of course differed but in particular their 'information fields' and 'perceptions' were unique. Consequently borrowing from the field of behavioural geography (for instance Pred, 1967 and Wolpert, 1964), I developed a decision making model listing the key influences under 5 domains and then applied the model to the seven interviewees. This model emphasises the filtering effect of an individual's information field. Each interviewee has only imperfect knowledge of all the factors that might affect their decisions to innovate or not. Each perceives her or his environment in an individual way and bases her or his decisions on the often very imperfect information that her perception has provided. Clearly each individual's 'awareness filter' affects her/his information field, perception and ultimately decision taken. Thus although a large number of factors can influence a decision it is probably only one or two that particularly impact on the individual's decision making process. Fig 6.25 shows this model and figs 6.26 - 6.32 show my interpretation of the key influences on each interviewee.

Models and the core data

Having applied the core data to a variety of models, both established and my own, there was no one model that 'fitted' perfectly. What constantly came across was the great complexity of the change process. Even so it was certainly worthwhile trying to apply the models since that very procedure gave new insights into the actors studied and the process of change. Two models I found to be most helpful in analysing the data. They were those of Fullan(1991) and Rogers(1983). Fullan's model of the innovation-decision process highlighted the 'out of phase' stages of actors (the main interviewees) and the departments. Only in the case of School 1E was there a coincidence between actor and department. It suggests lack of cooperation and teamwork in the majority of these departments. Roger's 5 adopter categories were, in his model, expected to range across a 'normal' distribution. This core data was far from normal in its spread across the adopter categories. By far the majority of those interviewed were either innovators, late majority or laggards. The question remains as to how typical is this small sample of teachers.

FIGURE 6.23

INFLUENCES AT THE SCHOOL LEVEL

(Based on LEA 1)

	SCHOOLS						
	A	B	C	D	E	F	G
Head							
Creates/works on atmosphere for curriculum department	x	?	?	?	√	?	√
Vision/knowledge	?	?	?	?	√	?	?
Backs/supports IT Co-ordinator	x	?	?	?	√	?	?
IT Co-ordinator							
Policy developed	x	?	x	?	√	x	x
IT across curriculum view	x	?	x	x	√	x	x
Courses laid on	x	?	x	x	?	x	x
Informs/links with departments	x	?	x	x	√	x	x

- x Not an influence
- Positive influence
- ? Uncertain/unclear

FIGURE 6.24

POSITIVE INFLUENCES AT THE LEA LEVEL

(Based on LEA 1)

LEA

Overall

- Environment for curriculum development
- Advisory/Administrative Structure
- Role of Teachers' Centre and courses

Geography Advisers

- Seniority/power
- Resources available
- Initiatives re-curriculum
- Facilitator of geography departments
- Knowledge of geography departments
- Vision and knowledge re-IT
- Links with IT adviser
- Clarity of policy

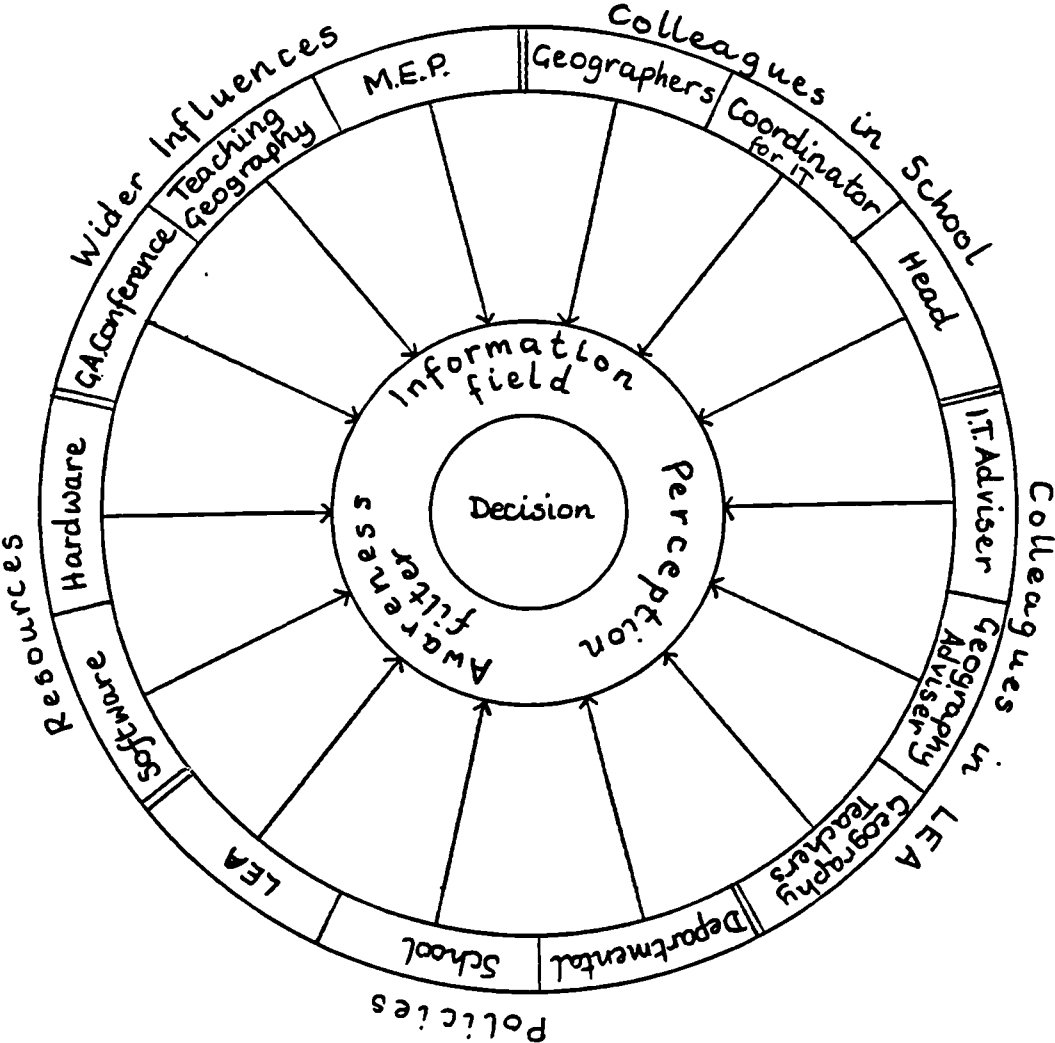
IT Adviser

- Seniority/power
- Resources available
- Initiatives
- Policy
- Vision/knowledge
- Links with geography adviser

Advisory Teacher (IT and/or Geography)

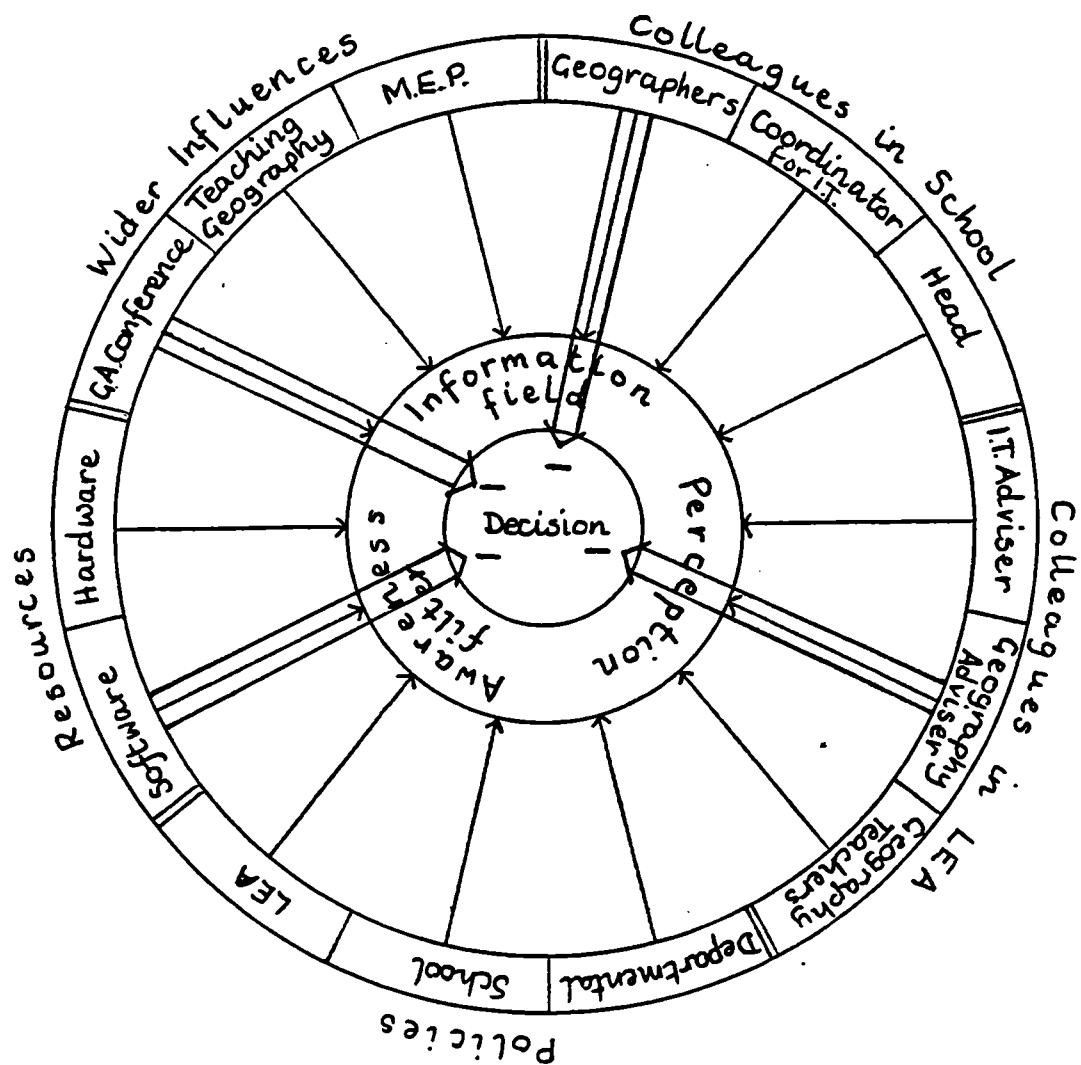
- Exists
- Energy and initiative
- Credibility with teachers
- Links with geography and IT advisers
- Personal knowledge/vision

Figure 6.25: A Model of the Decision Making Process



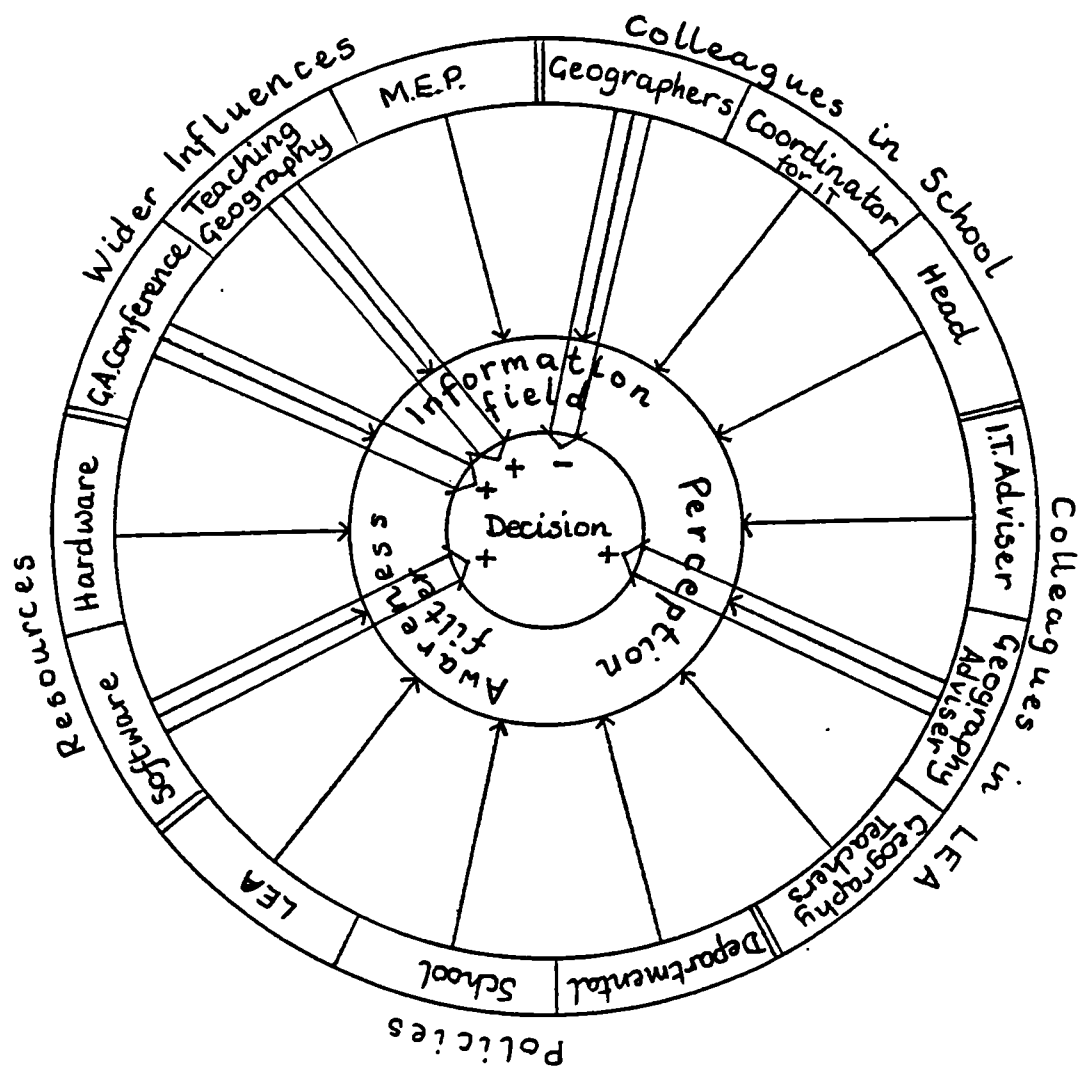
Positive influence
Negative influence

Figure 6.26: A Model of the Decision Making Process applied to Mrs.Rolfe



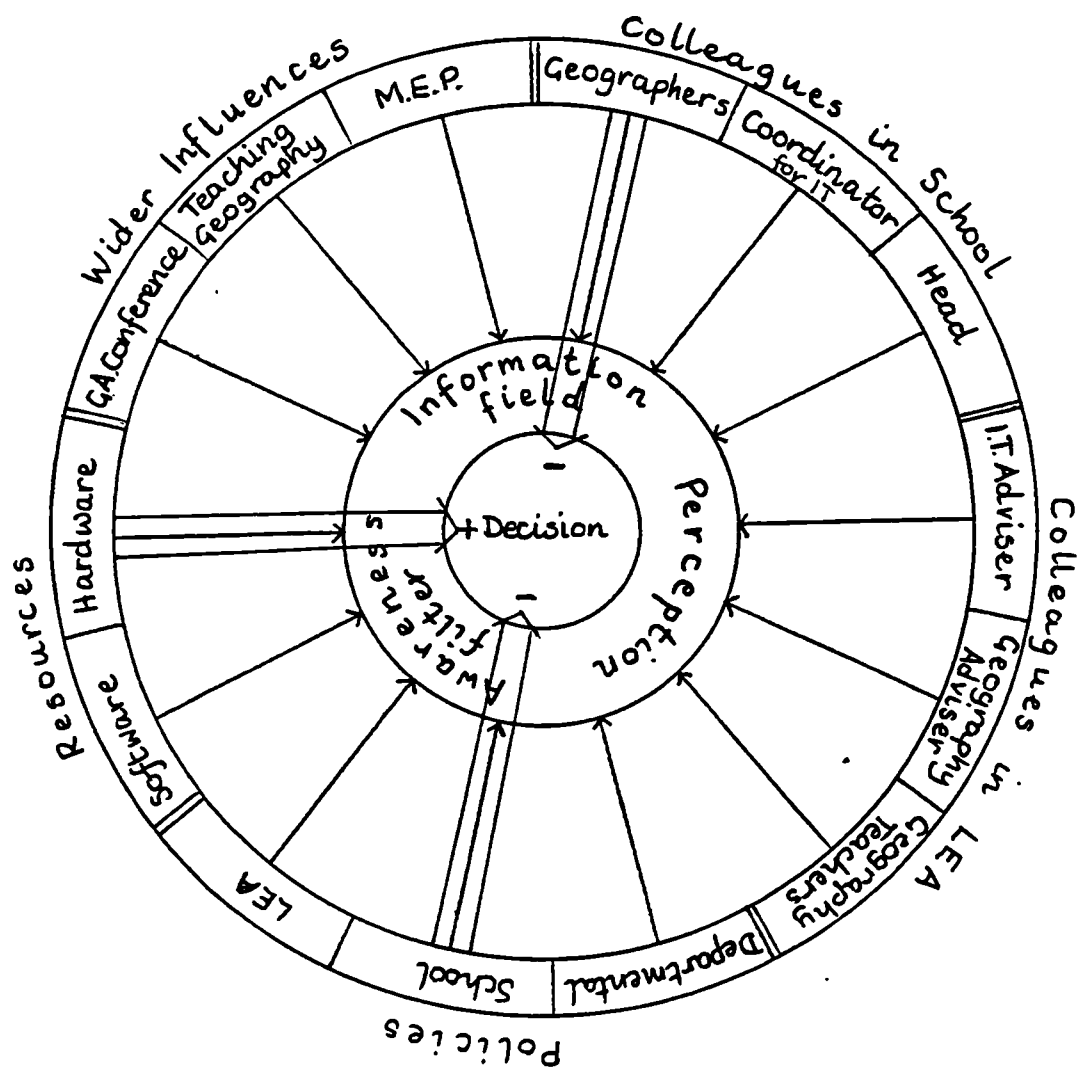
- + Positive influence
- Negative influence

Figure 6.27: A Model of the Decision Making Process applied to Mr.Davies



- + Positive influence
- Negative influence

Figure 6.28: A Model of the Decision Making Process applied to Neil Pope



- + Positive influence
- Negative influence

Figure 6.29: A Model of the Decision Making Process applied to Tony Lichfield

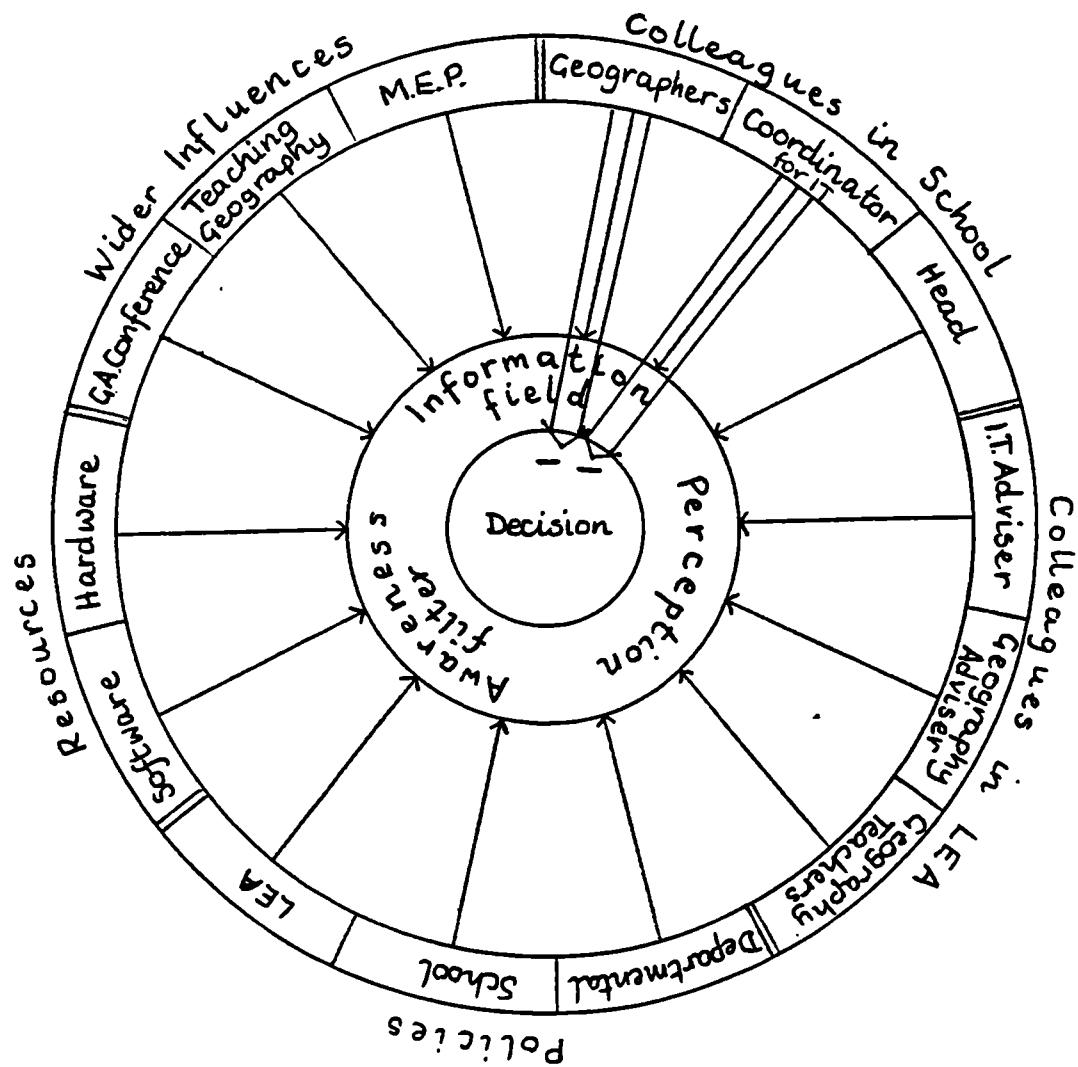
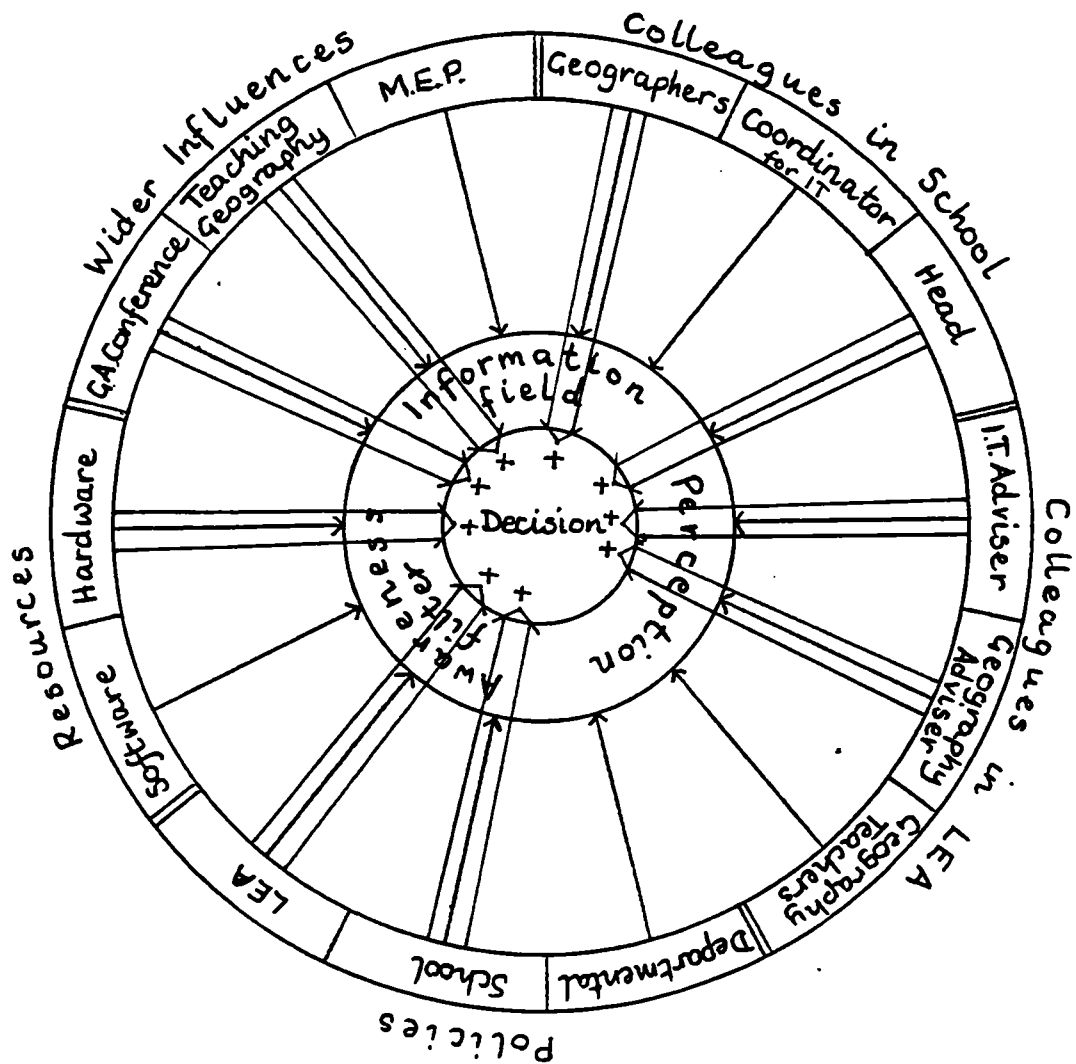
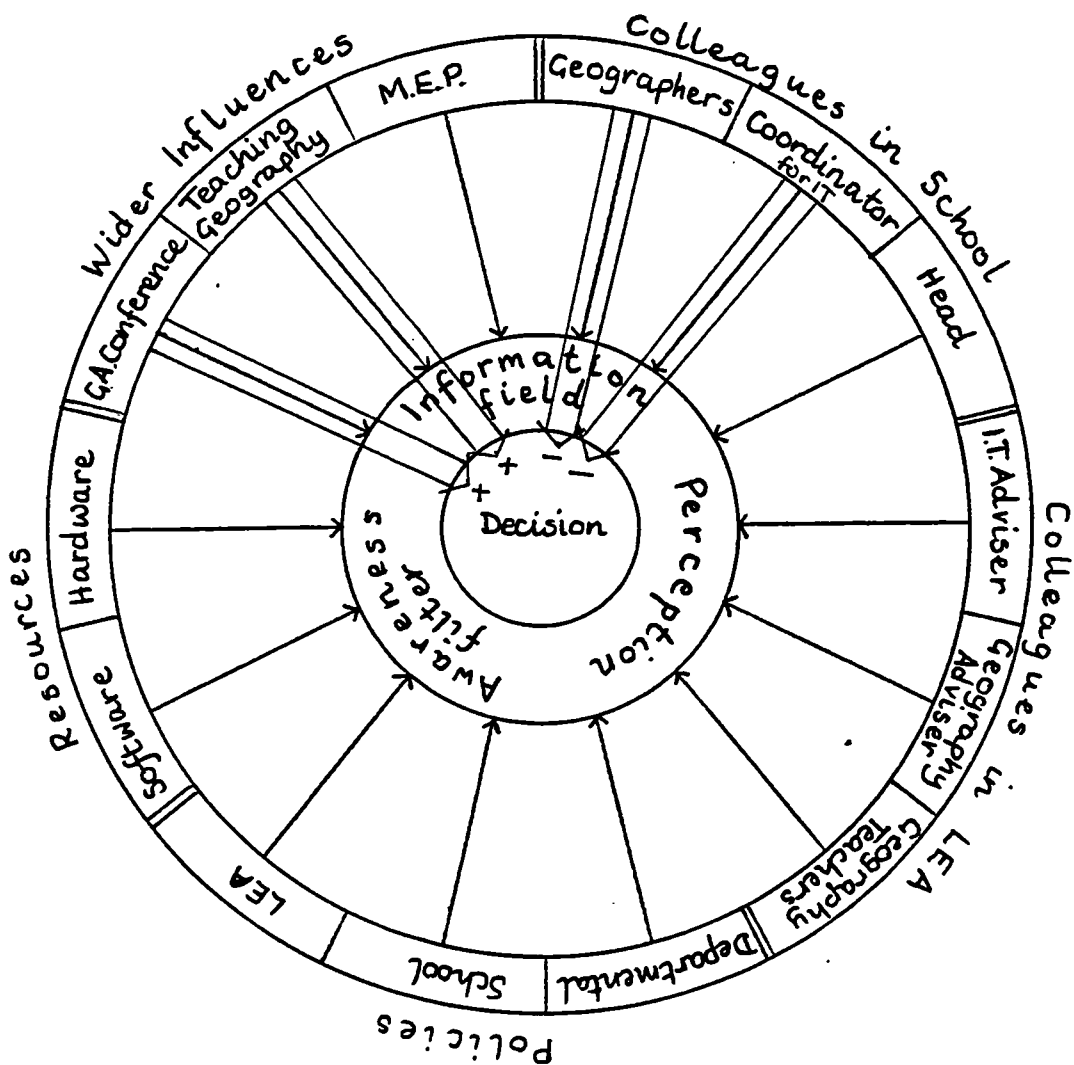


Figure 6.30: A Model of the Decision Making Process applied to Saul Jacobs



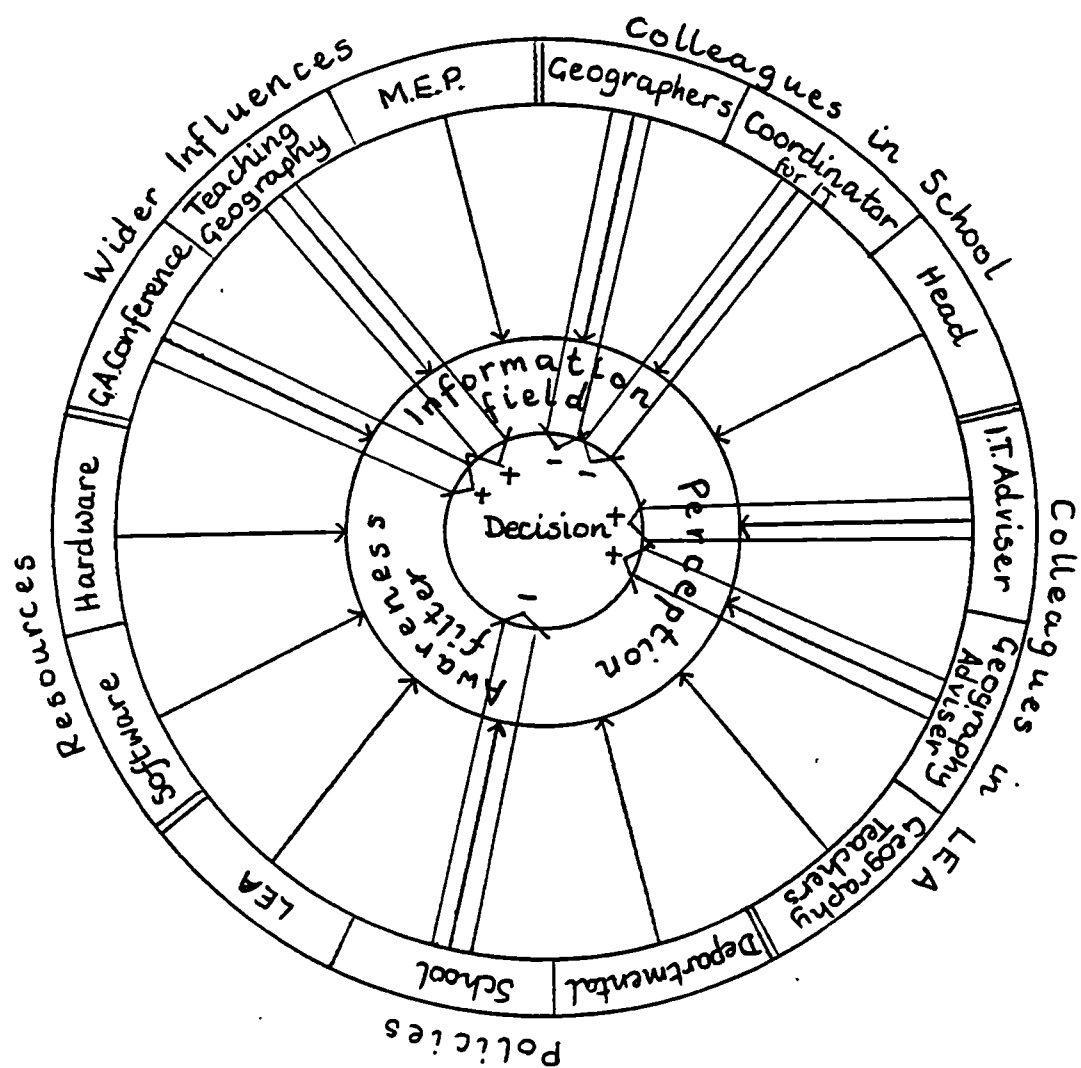
- + Positive influence
- Negative influence

Figure 6.31: A Model of the Decision Making Process applied to Sara Norris



- + Positive influence
- Negative influence

Figure 6.32: A Model of the Decision Making Process applied to Martin Moseley



- + Positive influence
- Negative influence

Three of my own empirically derived models threw greatest light on the change process. These were; the typology of four 'groupings' of actors; my version of the 'force field' model; and the decision making model. The typology model identified 6 'dimensions' which characterised the actors and this led to four groupings: solitary innovators; influential innovators; aspiring innovators; and solitary reactionaries. Again it reinforces how different teachers are from one another and how difficult it is to generalise about them. In particular, the sole 'successful' innovator who effectively 'spread the word' about the innovation was in a minority of one! A key question is how such innovators can be encouraged and helped to develop but perhaps first of all recognised.

Creating my own diagrammatic version of Lewin's force field model was valuable because it pointed up the important influence of positive and negative forces, their respective strengths and the balance between such forces having a direct impact on the level of activity. In particular this modelling emphasised that changes regularly affect these forces and their relative strengths and influence and thereby the changing levels of activity. Change in such activity is constantly occurring and not just in a positive direction!

The creation and application of a decision making model to the data pointed up the uniqueness of the information field, awareness filter and perception of each actor.

In sum these models pointed out to me what a complex range of factors influence the occurrence or not of change. The complex chemistry of factors bringing about change, such as happened for 1E in 1983 and 1985, occurred infrequently and was transitory. By 1989 the level of innovation in this department had fallen off considerably. The apparently key factors regularly 'associated' with change were; positive attitudes of actors; interest, drive, knowledgeability and commitment to the innovation; and a team innovating together. Occasionally the arrival of new staff was a positive influence on the change process yet on the other hand, underlying a good deal of inactivity was the 'environment' of the nineteen eighties (in LEA 1 at any rate). In other words the low morale, lack of incentives to change, and job insecurity of that 'age' did not encourage innovators. Of surprisingly limited positive influence on change was the role of LEA advisers, heads, software, hardware, the DES, TVEI, MEP, the GA and indeed policy at all levels of the system. By that I mean policy at departmental, school, LEA or national levels. Throughout my data collection I was struck by the lack of awareness of such policy. In the case of departments and school policy that was hardly surprising given that such policies did not

exist! On the other hand it is important to say that the most innovative individuals were strongly and positively influenced by LEA advisers, the GA and the MEP.

Key findings are firstly that many factors need to be in place before change occurs and even then that 'chemistry' only has a limited life. Secondly, it appears difficult for the most active and innovative actors to spread their expertise and enthusiasm to even immediate colleagues.

Chapter 7

A Contrasting LEA

LEA 2

Interviews were held with teachers and advisers in LEA 2 as is shown in fig. 5.9. The reason that this chapter focuses on LEA 2 is that when I studied the data for LEAs 1, 2 and 3 it became clear that LEAs 1 and 2 were particularly different, with LEA 3 somewhere in between. In LEA 1 there was a higher level of CAL geography activity, generally positive attitudes to the innovation and a successful interaction between teachers and advisers through a variety of initiatives. LEA 2 was quite different, indeed almost the reverse. The core data of this research is on LEA 1 since it offered an insight into a relatively positive model for curriculum development. By spending some time in this chapter on LEA 2 data I intend to enhance understanding of the change process. It will cast further light on the relative successes of LEA 1 and on the validity of the models of explanation.

LEA 2, as is true of LEA 1, is on the edge of the London conurbation. The decline in secondary school population in the Authority was estimated at 25% over the period 1985-1990. This led to closure of the one school and the merger of two more. Several schools underwent a reduction in pupil intakes. The borough had a population of 260 000 with 18 secondary schools.

Three Geography Departments

The choice for study at schools 2A, 2B and 2C was based on a combination of advice offered by Gail Joplin and Deryn Hartford. School 2C was regarded as a centre of curriculum innovation. School 2B had Sam Mars as head of department with a particular interest in CAL and school 2A was deemed typical or average. Personalities mentioned in this chapter are listed, with their roles, in fig. 7.1

I first developed portraits for the three departments and these are shown in appendices 7.1, 7.2 and 7.3. I undertook the same process for painting these portraits as I used for the portraits of departments in LEA 1 (see chapter 5). I shall now provide a summary of the key features of each school and department that struck me when re-reading the portraits. During the study period school 2A experienced a fall in student intake and at times was under threat of closure. Geography was on a downward trend attracting less students and was of low status in the school. Anton felt that humanities

Figure 7.1

LEA 2 Who's Who

* Gail Joplin
(Senior Secondary Adviser, left 1986)

* Kay Morris
(Humanities Adviser since 1989)

* Marlene Southern
(ESG AT in humanities 1988-1990)

* Jack Wright
(Geography lecturer at local polytechnic)

* Dan Godber
(Former warden of TC since 1978 and now chief adviser)

* Sidney Boyce
(Adviser for maths and computing until 1985)

* Paul Edwards
(Inspector for CS since 1988)

* Judy Bloom
(AT for CS 1983 - 86)

School 2A

* Anton Archer
(Longstanding HoD)

* James Right
(Longest serving member of geography department)

* Malcolm
(Geography teacher who left in 1989 to become an LEA adviser)

* Irene
(Young geography teacher)

* Ellen Foster
(PGCE student 1983/84)

* Kate Jackson
(PGCE student 1985/86)

* Alison Wilson
(PGCE student 1985/86)

* Bruce
(Head of science and I/C computers until 1984)

* George
(Head of CS Sept 1984 until July 1985).

School 2B (School closed June,1987)

* Sam Mars
(Formerly at school 2C;
HoD since 1981; seconded 1985/86 to undertake diploma in educational computing)

* Frank
(Head of physics and computers)

School 2C

* Cheryl Dean
(HoD 1983-84)

* Peter Essex (Junior member of department; then HoD 1984/85)

* Don Lewis
(PGCE 1983/4)

* Mr Denton
(Head of CS)

* Joan (HoD 1985 onwards)

Also

* Deryn Hartford
(HoD of another school in the Borough; Chair of LEA geography group)

* Peter Clout
(AT for geography 1989 onwards)

HoD = Head of Department
AT = Advisory Teacher
CS = Computer Studies
TC = Teachers' Centre
ESG = Education Support Grant

courses had partly caused that decline. He was certainly not a well organised head of department nor was he especially pro-active or forceful on behalf of his subject. Teamwork in the department was clearly lacking. Anton was not a directive head of department and although liked by fellow staff and an accomplished practitioner, he was not a great influence on his immediate colleagues. Anton was involved in a long-standing set of disputes with the head which probably reinforced the low status of geography. There was limited involvement in the LEA or in national level ventures by this department. TVEI had boosted hardware in the school but booking the computer rooms was problematic. Bruce, i/c computer studies until 1984, was not especially helpful or encouraging to departments and George, who helped Anton a good deal, left in 1985. By 1989 Anton's interest in computers had blossomed but there was still little evidence of activity.

School 2B was faced with falling rolls and the likelihood of closure which in fact took place in June 1987. In the view of Sam Mars this led to the lowering of staff morale and a block on curriculum development. Sam had a strong 'vision' for the future of CAL geography and was the only geography teacher in a team of five with any knowledge of it. This interest was reinforced in 1985/6 when he was seconded to undertake a diploma in educational computing. However there was a lack of activity in spite of his informed rhetoric. Sam had good experience and knowledge of the workings of LEA 2, having worked at school 2C for some years. He considered the geography group chaired by Deryn Hartford to be 'falling apart' and was critical of the LEA INSET on offer.

School 2C was markedly different from the other two schools. It was a large and oversubscribed school and geography was a popular subject with high status in a large department. Most members of the department had senior administrative responsibilities beyond geography. Cheryl Dean was not particularly liked or influential. She was regarded with some jealousy by the members of the department who had gone for her job. Throughout the nineteen eighties the HoD position changed hands several times. Only Peter Essex had any active involvement in CAL geography and by 1989 he too had been promoted to a wider position of responsibility. Throughout the study period there was a good deal of strong positive rhetoric about CAL geography but limited action. As a relatively self contained and successful department, they had limited contact with the LEA advisers. A good deal of hardware was available and some software was bought during the nineteen eighties. The head of computer studies was strong on IT across the curriculum but only Peter Essex was influenced by him. The other members of geography staff were

probably 'diverted' from curriculum development by their posts of responsibility outside the department. They appeared a competent group of teachers but were engaging in limited innovation.

Activity, enabling and constraining factors

Activity

Generally there was much less activity in CAL geography in the three schools studied in LEA 2 compared with those studied in LEA 1. In school 2A there was limited use of CAL between 1984 and 1989 apart from departmental administration and worksheet production. In school 2B there was no activity as far as I could gather between 1983 and its closure in 1987. In school 2C the use of CAL geography was restricted in the first few years of the study to Peter Essex who was head of department between 1984/5. Towards the end of the study period the department was using its own microcomputer for administration and there was some use of the school computer room.

MAPSKILLS was used for the first years, NOMAD by the second years and the lower sixth used STATUS and RIVER. By 1989, schools 2A and 2C had acquired the *Learning Geography with Computers* INSET pack but it was not used. A common element across the three schools apart from limited use was the expression of interest and good intents about bringing CAL into their curricula. However this rhetoric did not match the level of classroom practice.

Constraining factors

As was true of some schools in LEA1, two of the three schools studied in LEA 2 were faced with falling student rolls in the mid to late nineteen eighties. This nationwide demographic downturn of secondary age pupils meant that most schools faced the need to cut staff (School 2A) or close altogether (School 2B). This uncertainty of employment affected staff morale and it was put to me that there was thereby a reduced willingness of staff to engage in curriculum developments.

Geography departments in schools 2A and 2C were staffed by experienced teachers in the main, who had posts of responsibility for tasks beyond the department. This meant that curriculum development in geography was not necessarily their first priority. The nature of departmental leadership seemed to have an impact on two departments. In the case of 2A Anton was liked but was clearly a less organised and weak leader. In the case of 2C between 1984 and 1989 there were three changes of head of department. If there was an enthusiast with awareness of CAL geography it was usually only one member (e.g. 2B and 2C) who by all accounts had failed to spread that knowledge and

interest to other members of their department. Access to heavily booked rooms of micros was mentioned as a constraint in schools 2B and 2C and inadequacies of geography software was pointed out as a constraint by members of staff in those same schools. The influence of wider bodies such as the GA or MEP was minimal and the decline of the local geography teachers' group was commented on unfavourably by all teachers interviewed.

Enabling Factors

Hardware should not have been a problem in any of these schools because of the TVEI initiative but computer rooms were invariably fully booked. By the end of 1989 each department had its own computer which was mainly used for administrative purposes. Schools 2A and 2C had bought the *Learning Geography with Computers Pack* and interviews at each school suggest to me that each head of computer studies had at one time or another made efforts to encourage IT across the curriculum through the subject staff. Another potential enabling factor was that geography was strong and popular in schools 2B and 2C. Finally in the case of every interview conducted, I found an interest in CAL geography matched by stated intentions of activity. The reality was rather different!

Advisory Support

Gail Joplin was the senior secondary adviser for LEA 2 whom I interviewed in 1983 and 1985 before she left the LEA in 1986. She was a general adviser with responsibility for overseeing several humanities subjects including geography. This inevitably meant that she was somewhat distant from geography teachers in the borough and relied a good deal on Deryn Hartford whom she had asked to chair the local geography teachers' group. That was set up in 1979/80. Deryn was head of department in a local secondary school and had helped Gail fill in the questionnaire I sent her. Deryn's time was being increasingly diverted into CPVE directions and partly because of that geography was losing direction and momentum. Interviewing Gail in 1983 I discovered that her knowledge of both geography departments in the borough and CAL geography was patchy. She seemed overwhelmed by a range of LEA curriculum initiatives including profiling, records of achievement, appraisal, CPVE, TVEI and evaluation. IT was not one of these initiatives. Not surprisingly Gail relied on Deryn but also on Jack Wright from the local polytechnic to run sessions for geography probationers, now known as NQT's.

Gail spoke with circumspection of Dan Godber whom she suggested had a 'powerful personality' and described 'creative tension' that apparently existed between the advisers and the teachers centre.

I interviewed Sidney Boyce in 1983 and 1985. Sidney was adviser for maths and computing until his retirement in 1985. Maths was the original core of his job and it seemed that computing had been added later. Sidney suggested several reasons for the relatively undeveloped state of IT in the borough. He was particularly critical of the Chiltern MEP Region and the lack of resource available to him. On the latter his entire maths/computing budget was £2000 a year! He had set up a 'show school' in the borough where there was a software library and reasonable hardware but he was unhappy with the level of resourcing of that initiative.

He felt strongly that LEA 2 had not been well served by Chiltern MEP Region. 'MEP is a bit surplus to requirements in LEA 2'. He would have preferred the money allocated to Chiltern (£12 000 a year for each constituent LEA) to have been given directly to him and the LEA. He felt that he was 'unable to milk' the region and he felt that boroughs like his own got a poor deal out of MEP. His main curriculum emphasis was computer studies and putting hardware (particularly 56 micros) into his schools. Though I pushed him at interview, Sidney had a restricted vision for the future of educational computing beyond acquiring more micros and some thoughts on business studies. I found a vacuum of initiatives and knowledge expressed, a lack of enthusiasm and no obvious policy for IT in LEA 2. He did seem to be making a number of excuses for little action in the computing area. He retired in 1986.

Between 1983-1986 Sidney had the help of Judy Bloom as advisory teacher for computer studies. She had come from the local polytechnic and had a computer studies background. Her energies were directed at the primary schools and the secondary schools were left to themselves.

Marlene Southern was an Education Support Grant (ESG) advisory teacher for the humanities between 1988-1990 and I interviewed her in 1989. She had a background in industry and computing and then came into teaching first as a modern languages teacher and then as an IT lecturer at a local technical college. She reckoned that 'IT has been marginalised in an isolated teachers centre'. Her aim was to 'reduce resistances and increase confidence' and she saw the *Learning Geography with Computers Pack* as 'manna from heaven'! I asked her about the relatively indifferent progress of IT in the borough. She felt

that Sam Banks was innovative in the early 1980s but by the mid eighties had been overtaken and was behind many of the modern developments. She felt strongly that the lack of a specialist geography adviser in LEA1 had been a problem and that there was consequently 'a lack of clout in meetings where it matters'. Advisers in LEA2 in any case had only limited power and so IT had a 'lack of a senior 'ear' in the LEA to take it further'. She implies that Dan Godber as warden of the Teachers' Centre had more power than the advisory team. In 1988 when Sidney Boyce retired he was replaced by Paul Edwards who again was an 'adviser'.

I asked her about the lack of IT policy in the LEA. 'But there was never any policy - a lot due to the fact that computing/IT didn't have an adviser. Sidney was the maths adviser not the other... because he wore very many hats there was not the emphasis there should have been and I think the blockage was higher than that because they didn't give him more time or people'. She argued that by 1989 'things have improved but there is still an element in the system which remains to be convinced about IT across the curriculum'.

I then interviewed Dan Godber in 1985 since he was clearly an influential figure in the LEA. He had been Teachers' Centre Warden since 1978 and by the late nineteen eighties had become chief adviser. There did seem to be a battle for power going on between the advisers and Dan Godber. He had been in the LEA longer than most advisers and was accountable directly to the Director of Education. Half of the LEA's budget went to the advisers and half to the teachers' centre. He had a strong belief in teachers' groups and the centre's main function as a meeting place.

'The teachers' centre has very little resources - it is not resource based.... main decision making is undertaken by a complex pattern of groups of teachers.... We are not accountable to the advisory system at all'.

He seemed fully aware of the problems of the geography teachers' group.

'They have large problems at the moment... I don't quite know why.. the kind of drive in the group has waned somewhat.. some key people have moved on'.

Overall he was critical of colleagues in the borough. 'One could be critical of the work of the advisers... they don't have heads of department meetings - they haven't strengthened up the support for those'. He moved his critique onto Sidney and Judy. 'Sidney and Judy represent the technical approach to

computing (not curriculum based)... Sidney is the one area where you could put the biggest cross against...it just doesn't work'.

Most surprisingly perhaps, given his commitment to the importance of teachers groups, is his critique of teachers in LEA2.

'The skills, drive and the energy of teachers to go out and seek things is not an LEA characteristic... produce your GCE 'O' levels and traditional syllabus and if you keep on doing that for 20 years then you've done your job.... that's a bit of a caricature but it's not far off' I have been involved with the national scene for a long, long time... I have been through these things before... so I have a notion of direction.'

As to the advisory support given to the humanities he felt they were of 'very low priority.

In his report on computers in education (1986) Sam Mars wrote a chapter on the work of LEA2 in which he focused on the advisory service there. He discussed the rapid growth of the Teachers' Centre. '

Considerable growth has taken place at the Teachers' Centre in the last couple of years (1984-6) with the appointment of eight advisory teachers, on two year contracts. The role of the Centre is to provide information and support curriculum development through in service training... The Curriculum Initiatives Group set up in 1982 is noticeable in having already initiated changes in some secondary schools.'

This is very much the group supported by Dan Godber, focussing on profiling, CPVE and evaluation for instance. IT is notable by its absence.

'As yet there has been no specific appointment of an adviser for computing. This function is being carried out by the adviser for mathematics aided by an advisory teacher for computing.' When Sam visited six schools in the LEA in the spring of 1986, none had a computing policy 'but were aware that they should possibly develop one'. In other words advice on developing computer policy was not coming through from the LEA. In his chapter on the LEA he states that '

"It would be true to state that most schools have developed effective computer studies and computer awareness courses for the full 11-16 age range.. these .. all amount to an attempt to create a higher level of computer awareness.... The development of computer uses across the curriculum however are considerably less extensive. There is a growing awareness that the opportunity offered by a wider application of computing in education should be 'explored'"

Sam mentions 'role-overload' in relation to Sidney Boyce who was 'covering' maths, computing, business studies and economics. 'The role of the maths adviser in LEA2 was considered to be too broad'. Sam also pointed out the derisory budget of £400 for the academic year 1985/86 at the disposal of the advisory teacher for computing. He complained that much of the INSET offered was at a low level of sophistication and only reached a small number of staff. He also remarked that, 'the reliance of staff in their own time could therefore be regarded as an inherent weakness and curb on innovative change which industrial action has merely highlighted'.

He concluded his chapter by stating that 'the effectiveness of the advisory teacher for computing was considered to be limited... (his) perceived importance and status in the eyes of school based staff, had been eroded'. Sam argued that it was of key importance for one adviser to be appointed at full adviser level responsible for computing. 'The status thus accrued was seen as vital in providing the direction and momentum for the formulation and funding of a borough policy for computing in education'.

Models and LEA2 Data

I have applied the data from LEA2 to those existing models which are to some extent applicable. Using Roger's (1983) categorisation of actors I categorised the teacher interviewees as follows:

Innovator	- Peter Essex
Early Majority	- Sam Mars
Late Majority	- Cheryl Dean
Late Majority/Laggard	- Anton Archer

In LEA1 many interviewees were innovators or early adopters. This was not the case for LEA 2 though Anton Archer probably changed categories by the late nineteen eighties from laggard to late majority.

Havelock's (1969) typology of linking roles seemed inappropriate for LEA 2's teachers and advisers. There were no linking roles for the three main teachers interviewed and the three LEA staff interviewed (Joplin, Godber and Boyce) did not engage in a linking role as far as CAL geography was concerned.

Applying Dalton's teacher sub-cultures I determined that each of the three main teacher interviewees were liberal/traditional and far from 'radical'. This is similar to LEA1.

I found White and Lippitt's (1968) leadership styles difficult to assign to the teachers but if anything Anton Archer, definitely, and Sam Mars probably, were laissez-faire and Cheryl Dean, autocratic.

Applying Chandra's (1986) attitudinal classification I found each of the three 'critical', that is generally positive but with several critical comments about the way computers should be used or about associated hardware and software. The exception though a minor interviewee (ie. only interviewed once) was Peter Essex whom I classified as 'favourable', that is impressed and enthusiastic about computers. The categorisation 'critical' was true of the majority of teachers in LEA1.

When I applied Roger's (1983) model of stages in the innovation - decision process I identified teachers at a range of stages, which is again true of the data for LEA1. Anton Archer was the one interviewee who changed stages over the study years. My classification is as follows:

Anton Archer:	Knowledge (Stage 1) then Persuasion (Stage II) then Decision (Stage III), adoption.
Cheryl Dean:	Persuasion (Stage II)
Sam Mars:	Decision (Stage III), adoption
Peter Essex:	Implementation (Stage IV).

When I applied Fullan's (1991) initiation - outcome model I found that all actors and departments were at Stage I, initiation. Only Peter Essex was anywhere near the implementation Stage. This was true of most of the departments in LEA1 but not for the actors.

Finally when I tried to apply the Bennis, Benne and Chin (1969) typology of innovation strategies there seemed to be no obvious innovation strategy at work on behalf of both teachers and advisers. This is a considerable contrast with LEA1.

Applying my own models to the data I started with my fourfold groupings derived from the LEA1 data.

The following was my categorisation:

Solitary Reactionary - Anton Archer in the mid nineteen eighties.

Aspiring Innovator - Sam Mars, Cheryl Dean
Later Anton Archer

Solitary Innovator - Peter Essex.

This represents a narrower spread than for LEA1.

I then applied my force-field models to the three departments. These are shown in figures 7.2, 7.3 and 7.4. Generally they suggest very little movement in the direction of 'activity' and a host of strong, negative influences.

I then went on to tabulate the nature of actors and environments across the three schools (fig 7.5).

I did not plot changes in activity through the nineteen eighties since it can be seen from figures 7.2, 7.3 and 7.4 that minimal change has occurred.

The only other model of mine that seemed important to apply to the data was the decision making process model and that I have done for the three main interviewees in figures 7.6, 7.7 and 7.8. In general these show the dominance of certain negative influences. Lack of geography collegiate support recurs for each diagram and 'resources' were significant negative influences on Sam Mars and Cheryl Dean.

The Views of Sam Mars on LEA2.

As has been mentioned earlier Sam Mars undertook a diploma in educational computing in 1985/86 and wrote an unpublished report in June 1986 entitled 'Computers in Education: A policy for curriculum innovation'. In that study he engaged in case study analysis of three LEA's but then focused in on LEA2. He undertook a historical evaluation of computing initiatives in that LEA then conducted in depth case studies of six schools in the borough. His interest in this field and his long standing knowledge of and teaching within LEA2 gave a unique insight into computing in the borough.

He considered that several conditions needed to be met at LEA, school, subject department and individual staff levels before the innovation of IT across the curriculum would be implemented. The following are the conditions that he listed:

Figure 7.2: Force Field Model of School 2A

Very limited use
of CAL Geography

Considerable use
of CAL Geography

1984

→
TVEI network of
computers

←
Geography has low status / under threat
←
Conflicts between head and Anton / Malcolm
←
Lack of teamwork and strong leadership
←
Head of CS not interested in CAL across
curriculum
←
Limited impact of LEA or wider influences
←
Lack experience / knowledge of CAL in
department

1985

→
BBC micro in department
→
Anton more aware and
interested in computers
→
George i/c CS helpful to
Anton

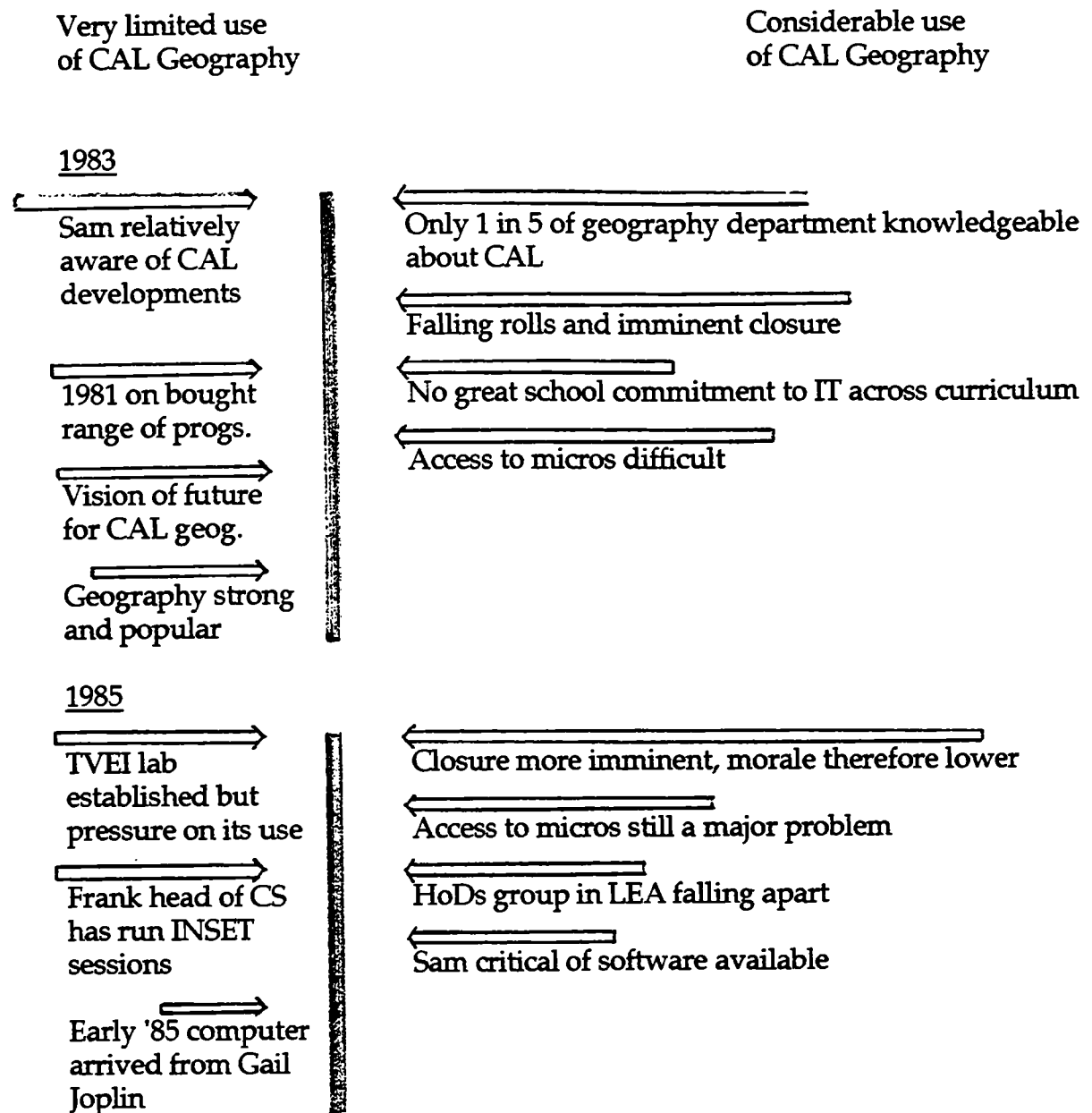
←
Threat of school closure
←
Continuing loss of status of subject
←
Loss of 1 member of geography staff
←
Limited staff stability in geography

1989

→
New minibus in department
→
Anton very keen on IT and
possibilities

←
George left in 1985
←
Continuing lack of teamwork and
leadership

Figure 7.3: Force Field Model of School 2B



Footnote

School closes in June 1997.

Sam successfully undertook in 1985/6 a diploma in educational computing - but school fails to benefit from this expertise.

Figure 7.4: Force Field Model of School 2C

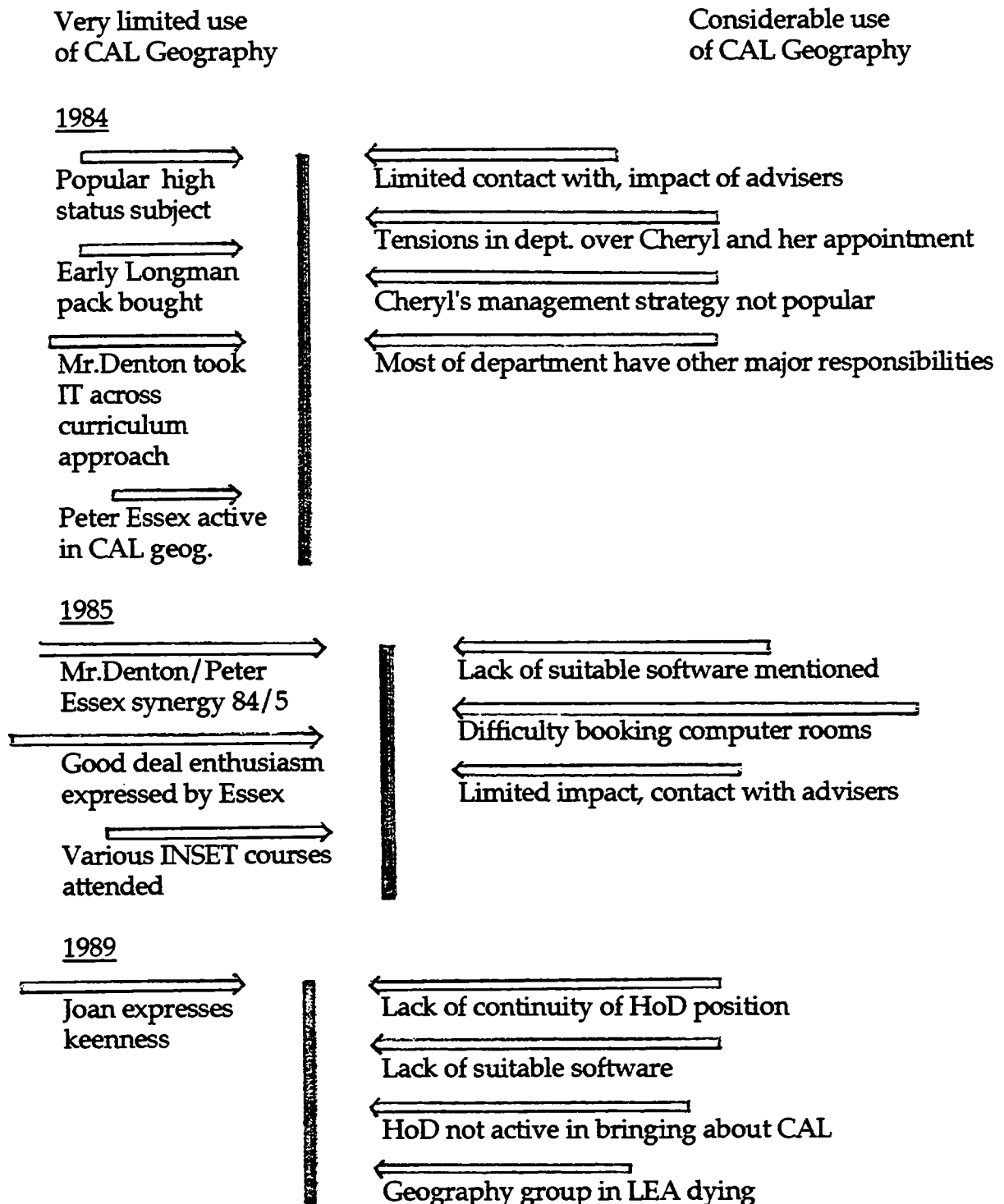


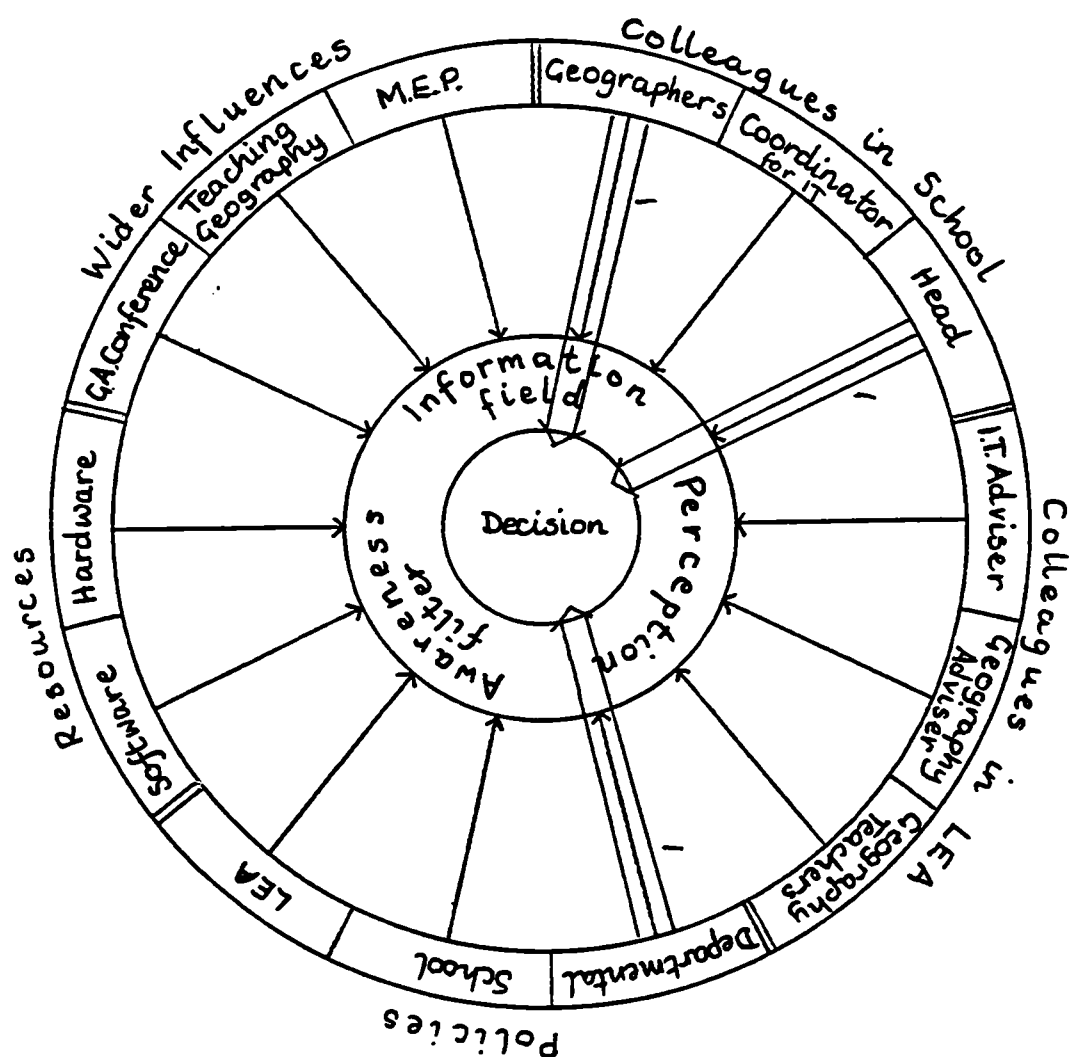
Figure 7.5 Actors and Environments in LEA2

Scho ols	ACTORS					ENVIRONMENTS				OTHER
	Activity	Interviews	Colleagues	IT Co- ordinator Head Teacher	Advisers	Department	School	LEA	Wider	
A	Limited except now admin. and w/sheet production	Was ignorant of developments. Innovator but poor manager: Became enthusiast very recently. Attitudes/ knowledge change dramatically. Friction with Head	Gradual loss of staff to other schools and other responsibilities in school. Lack of departmental team	Head keen on getting a BBC lab. Bruce - head of IT is also head of Science. New head of IT is not pro active. More keen on CS but has CAL hopes - since dashed	Lack geography adviser - 1989 INSET pack meeting was helpful.	Declining dept in face of threat of humanities	Move to computer studies and appreciation No IT policy. A declining, threatened school	Lack of IT across curriculum movement. Local geography teachers group - declining fortunes. Lack IT drive in LEA	No obvious influences/ impact on geography at all	CD less easy because of ability range. Sudden change with arrival of Nimbus - wants secondment. Role of George 1/C CS - left disillusioned
B	No use as far as one can gather. Not as informed as he thinks he is!	Very experienced in computers - early BBC A and bought geography programs. Finds CD difficult in this environment. Enthusiastic but sees constraints. Lots interesting views. Deep pessimism	Strong dept but imminent closure, so CD not considered. Second- ments encouraged. Reckons young teachers not taking on CD	Head keen to have hardware - lack vision. Head of physics I/C CS. New head in holding operation	Lack contact. No geography adviser. Geography group dying. New adviser faces difficult tasks	Survival and holding operation.	Dramatically falling rolls and imminent closure. Computer awareness and TVEI needs. Access to hardware a problem.	Critical of LEA courses. Nimbus and CS drive. IT across the curriculum not appropriate	No evidence of wider influences.	Sink school re- ability. Subsequently did a diploma in educational computing. His recommendation is not taken up. Lost to LEA.
C	Waiting but lots good intentions. Some departmental administration with departmental micro and 4 packages used	Cheryl had management problems with other members of dept. Had good link with Denton. Later all geography staff going other things	Lack of HOD continuity over years. Mr Essex alone has taken interest/action. Self contained dept. Conflict in 83/4	Mr Denton keen on IT across curriculum. Head a keen facilitator. Mr Denton had 'vision'	Limited contact. Scathing re lack of geography adviser	Progressiv, popular, highly rated department.	Atmosphere of CD in general. Over-subscribed. Good hardware facilities but access still a problem	No LEA policy comes through	None in evidence. Course at AUCBE	Denton/Essex axis beginning to bear fruit but lost because of Essex promotion. Action still awaited.

CD= Curriculum Development
CS = Computer Studies

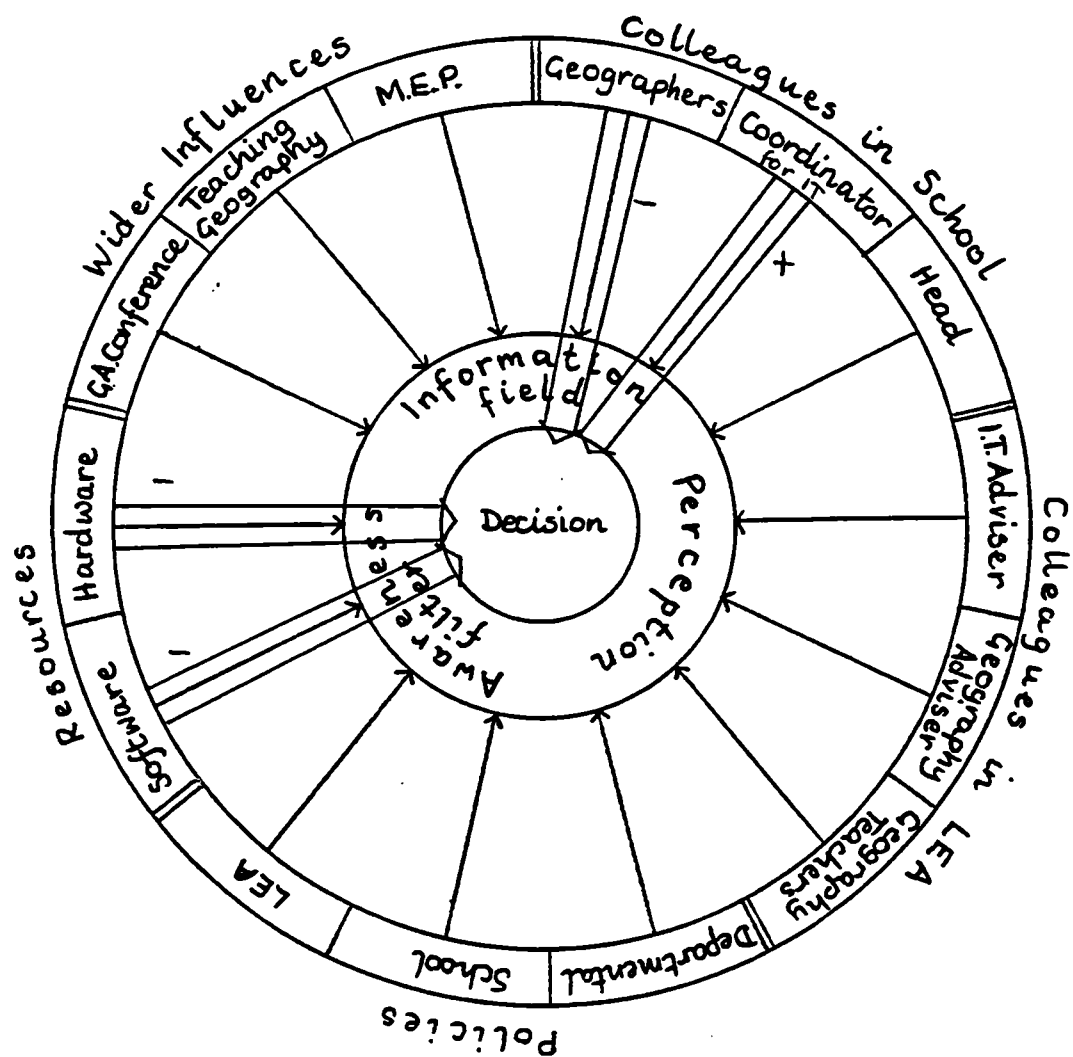
AUCBE = Advisory Unit for Computer Based Education
HoD = Head of Department

Figure 7.6: A Model of the Decision Making Process applied to Anton Archer



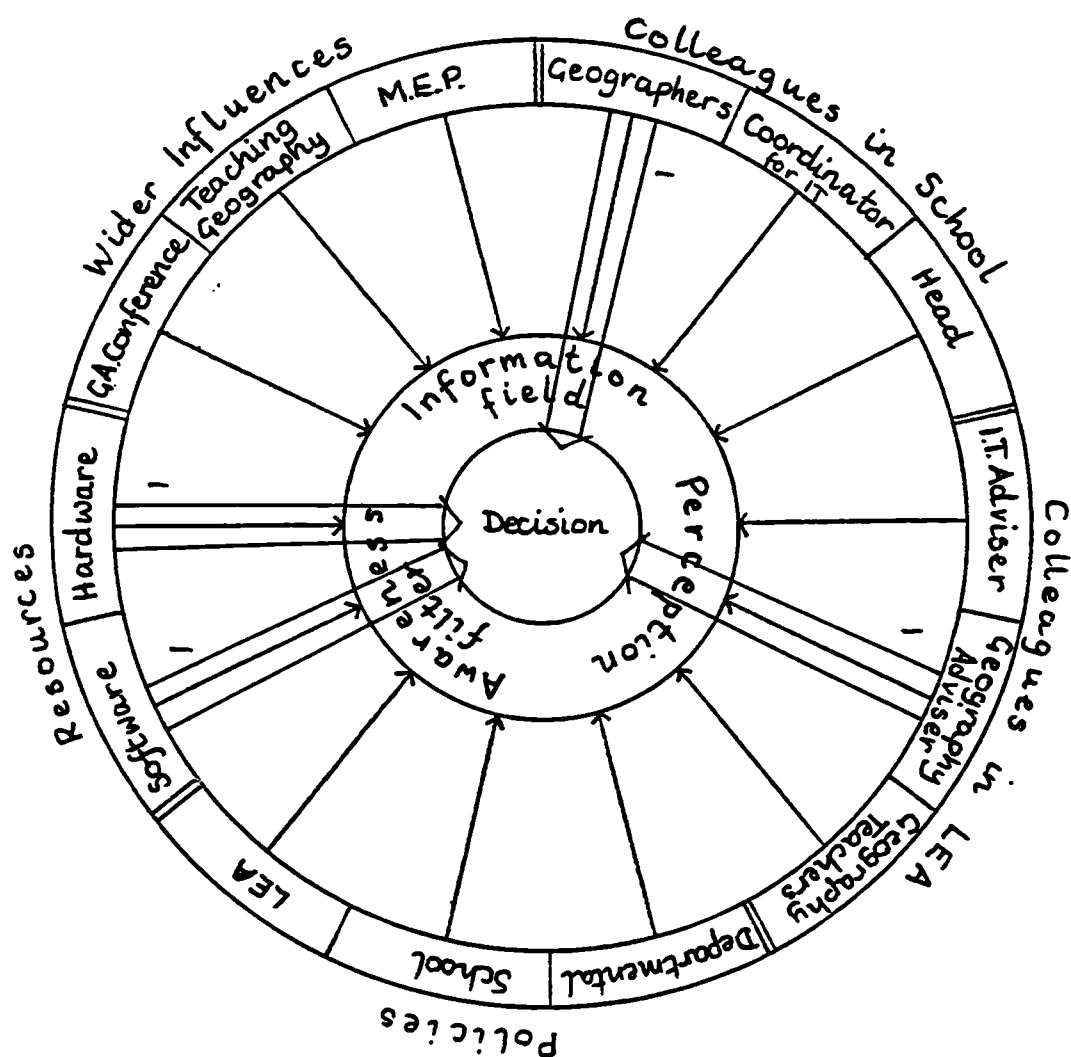
- + Positive influence
- Negative influence

Figure 7.7: A Model of the Decision Making Process applied to Sam Mars



- + Positive influence
- Negative influence

Figure 7.8: A Model of the Decision Making Process applied to Cheryl Dean



- + Positive influence
- Negative influence

LEA LEVEL:

- 1) *A supportive LEA policy which releases funds, for the introduction and continued support for the uses of computers in schools.*
- 2) *An awareness and leadership at the advisory level within the authority, to initiate and maintain the momentum of the authorities computer initiative.*
- 3) *Centralised support functions for the maintenance of hardware, the provision of INSET and the diffusion of ideas.*
- 4) *A measure of centralised organisation to encourage the standardisation of equipment, the production of locally relevant courseware and the production/purchasing and subsequent loan of peripherals, software, databases and documentation.*

SCHOOL LEVEL:

- 1) *A school based policy for the use of computers which determines the rate, extent and direction of the computer innovations as appropriate to the school.*
- 2) *The support and participation of, one or more, senior members of staff is crucial in leading and lending credibility to the value of computing in education.*
- 3) *The provision and support of school based computing expertise to diffuse ideas and encourage other members of staff to develop the use of computers.*
- 4) *The removal of the organisational barriers inherent in the timetable and other practical considerations including the redirection of resources to support the computer initiative.*

SUBJECT DEPARTMENT LEVEL:

- 1) *An outlook which encourages curriculum development allied to the use of computers.*

- 2) *The support of the HOD for the use of computers in the work of the department and its continued funding.*
- 3) *A departmental strategy which encourages staff attendance at INSET and allows for continuous staff development.*
- 4) *The provision of departmental based computer(s), peripherals and software.*

INDIVIDUAL STAFF LEVEL:

- 1) *A willingness to develop new methods of teaching and accept a new role in the classroom.*
- 2) *Overcome the anxieties of coping with an often less than friendly, complex technology.*
- 3) *An understanding of the wider implications of the microelectronics revolution with respect to society and educational method, content and style.*

Mars argues that,

'The introduction of computing across the curriculum cannot therefore be considered as an isolated task. Its implications for the style, content and methods of teaching and learning require computers to be considered in the wide context of curriculum development at all levels in the education system'.

Further Sam Mars related what colleagues in LEA2 had told him were constraints on take-up:

- 1) *The lack of hardware and the limited access to that available.*
- 2) *Software packages were considered expensive in view of the level of capitation available to a typical secondary school department. (A Humanities subject is likely to have approximately £1.75 - £2.00 per pupil per year to meet all its consumable and capital costs).*

- 3) *The level of training required was regarded as considerably more than for other educational initiatives and far more than a two day training course could provide.*
- 4) *Many subject staff were faced with a large number of changes and new initiatives, computing often being considered one of the least attainable and lowest priority objectives.*
- 5) *The need for extensive practical support for non-computer specialists within the school.*

He identified certain characteristics of those who had used computers in their teaching.

- a) *A particular personal interest in computing.*
- b) *Personal ownership of a computer, making work at home a possibility.*
- c) *Readily available hardware on a day to day basis within the school.*
- d) *A willingness by generally experienced staff to experiment with their style and methods of teaching.*

Finally Sam Mars concluded his dissertation by suggesting certain recommendations for LEA2.

- 1) *The formation of a formal body within the Borough, including members from all levels in the LEA, to formulate a policy for the development of the new technology, within the education provision.*
- 2) *The appointment of an adviser, with the sole task of overseeing the use of new technology across all subject boundaries.*
- 3) *A shift of emphasis away from a "hardware-led" innovation towards a software and applications first approach.*

- 4) *An adequately funded central support unit with a practical role, to support the development of computing linked to curriculum development.*
- 5) *A reduction in the reliance of INSET on voluntary attendance, outside normal school hours.*
- 6) *INSET and support functions should be a direct response to the needs of school initiated innovation, rather than an attempt to cover a wide general brief.*
- 7) *Encourage the development of computer use across the curriculum in the first three years of secondary education; in order that pupils may build on their junior school computing experiences.*
- 8) *Support subject based working groups, to develop software and support documentation within a framework of curriculum development.*
- 9) *Encourage the spread of hardware and software into school departments rather than continue the trend of centralised computer rooms.*
- 10) *Specific support for school based INSET particularly in providing a reduced pupil contact time for identified computing 'experts', in order that they may assist other colleagues in the classroom.*

(Mars, 1986)

Comparing the two LEA's

The two LEAs studied were quite different at LEA, school, departmental and individual teacher levels.

However there were some common elements. In neither LEA was there evidence of a great deal of high level, ongoing activity in CAL geography although the overall level of activity was much lower in the schools in LEA2. Furthermore the general environment for schools in both authorities was underpinned by falling school rolls and some industrial unrest. This led, I was told by teachers on several occasions, to feelings of insecurity, a lowering of staff morale, and a dampening impact on teachers taking part in curriculum

developments. Common to schools in both systems was the lack of united, innovative departments working as teams. Finally, many teachers spoke to me of interest and intentions for CAL geography but this was rarely matched by action.

The differences far outweighed the similarities. LEA2 did not have interest expressed in IT at the top level whereas in LEA1 a powerful deputy director of education was a great proponent. LEA2 had committed resources to a range of cross curricular initiatives but not to IT across the curriculum. Perhaps most different was the great gulf in expertise, commitment and teamwork of advisers in the two LEAs. Both Sidney Boyce and Gail Joplin were overstretched with seemingly over-wide briefs. This meant that IT across the curriculum was at the edge of their responsibilities. Similarly Gail had a weak grip on and interest in the geography teachers in LEA2. The geography teachers group was felt to be dying and was weakly resourced. Additionally the divide, even friction, between the warden of the Teachers' Centre and the advisers was unhelpful in encouraging and supporting such innovations. The potential synergy was lost and it split resources and effort. Far from being a 'creative tension' as Gail had put it, I saw it as dampening down likely curriculum changes.

There was no policy for IT across the curriculum and Sidney's vision was weak, dated and limited. Much blame was placed on the shoulders of the Chiltern MEP but few demands were made of the latter. No links for geography teachers had been made with the geography education section of any local institution of higher education and very limited INSET for geography teachers was made available. This was reinforced by the geography teachers' group falling apart. Finally LEA2 was a strong TVEI authority, unlike LEA1, which had furnished much hardware to the schools. However access to such computers became no easier. At the level of the individual geography teacher there were very few that I heard of or indeed spoke to who were interested and/or innovative in CAL geography. This contrasts with LEA1 where there were several, though solitary, innovators.

What I noticed throughout my interviews with teachers and advisers in LEA2 (apart from Dan Godber) was a clear insularity. National level developments and institutions seemed to have very little impact there. So the GA, MEP, GYSL Conferences, higher degrees and so on were hardly mentioned.

Though a touch reductionist, generalised and stereotypical, it could be argued that LEA1 had the following characteristics (Fig 7.9). The vast majority of

Fig 7.9 A Generalised Portrait of LEA 1

"The advisory structure is well established, well funded and has a tradition of support for teachers. The geography and IT adviser liaise regularly and each has a national perspective on their work via involvement in national level committees. Both have risen rapidly in the administrative hierarchy. The geography adviser has established various new initiatives for his teachers and has been a driving force behind the establishment of a curriculum development centre in the LEA. He has a clear management strategy which identifies certain heads of department as key actors in achieving change. In particular he has paid for four of his senior heads of departments to attend full-time a year on a MA Geography in Education course at the local university. He first saw the benefits of IT in geography in a previous LEA and throughout the nineteen eighties adopted a range of INSET strategies to help the innovation 'take-off'. His colleagues, the IT inspector, has a powerful position within the LEA and has developed a progressive and well-supported LEA policy. He has a strong vision of how he wishes the LEA to progress and has had the 'ear' of the deputy chief education officer. He has been assisted by an advisory teacher for IT. Another key player has been a local head of geography who undertook a full-time MA course; compiled an INSET pack for teachers, funded by a national agency; became an advisory teacher and warden of a newly-established teachers' centre; and in 1990 has become the inspector for Geography in the LEA. He worked for several years with the original geography inspector to attempt to bring about IT in the geography curriculum of local schools."

elements of this portrait could be said to be the opposite for LEA2! This will be considered further in chapter 8.

Chapter 8

Conclusions

This research has been about the processes that lead to the success or failure of the implementation of an innovation. I adopted an interpretative approach to this curriculum research which may be summarised as a longitudinal, multi-site study of cases. In some senses it is however 'mixed frame' or 'controlled action' research (Slater, 1996 p.314) since some elements of the scientific and action research tradition as well as the dominantly interpretative stance have been included.

Methodological issues and concerns were discussed in Chapter 3 . In particular the limitations of the case study strategy and the ethical issues raised by this research were considered. The research has been set in a particular group of contexts, in other words the educational and IT 'environments' of the 1980s, 3 London LEAs, and certain schools within those LEAs. The study mirrors closely three of the common characteristics of case studies listed by Roberts (1996);

- * *"The case is studied at a particular time within a particular social, economic, cultural and political context, which needs to be taken into account in interpreting the case study. Case study research has to relate the particularity of the case to the generality of the context.*
- * *The case is bounded by the researchers' interests, by the theoretical assumptions they bring to the investigation and by the constraints of time and resources under which they are working.*
- * *The case is unique. It will have its own 'idiosyncratic combination of elements and events' (Mitchell, 1983, p.188)," (Roberts, 1996, p.136).*

These points lucidly describe both the major strengths and the limitations of my research. But the relatively new strategy adopted here of cross checking via multi-site case studies improves the reliability of the findings.

On the other hand this research has taken a particular perspective on the study of this innovation process. That perspective has been the focusing in on heads of department and to an extent advisers as key actors in the process. It has

also focused in on the departmental, and to an extent school and LEA, levels (environments) of the system. Inevitably then this is but one perspective on the process of innovation and is therefore inevitably partial.

Another limitation to this study could be argued that CAL is a unique and idiosyncratic innovation and can therefore lead to only limited additional insights into the wider processes underpinning curriculum change. Furthermore it could be argued that the innovation was fundamentally flawed throughout the nineteen eighties and that this was consciously recognised by teachers who simply rejected it. I contend that CAL does have some distinctive elements as an innovation but that in many ways was a particularly interesting innovation to study since it was so thoroughly supported and promoted from various directions and it was so readily identifiable once implemented. Furthermore like other innovations it had (still has!) pedagogical flaws but was at the very least worth piloting by geography teachers over the decade. I suggest that the processes of change are generally similar whatever the innovation being studied.

What is a valid criticism of this research is that I collected too much data at the school, LEA and nationwide levels which I subsequently could not handle and had to abandon. On the other hand preliminary analysis of the questionnaire data for LEA 3 and the national advisers' questionnaires deepened my understanding of the innovation process and this I was able to apply to my understanding of the core data.

In pure case study style the major findings of this research lie in chapters 5,6 and 7 in which the data is portrayed and analysed. It is for the reader to gain insights and draw his/her own conclusions. I trust that it has been 'down to earth and attention holding, in harmony with the readers' own experience', (Adelman et al, 1980, p.59) and 'rings true to the outside reader', (Roberts, 1996, p.138). In that spirit I will not rehearse the data as already described and analysed.

What I intend to do here is to make my own concluding and brief observations on the research. My first point would be that implementation of the innovation studied here required a complex range of positive environments and actors for it to take place. Even then this complex chemistry of factors did not always lead to uptake. Constraints and factors of inertia clearly held sway and even given highly favourable circumstances, change was difficult to achieve. I am reminded of a statement made by John Chubb at a meeting of the Educational

Computing Working Group of the Geographical Association on October 19th 1985, 'In Staffordshire we have a supportive geography adviser and computing adviser, have met together several times about CAL geography, have quite a deal of expertise but only 10% of geography teachers at most could be considered CAL users'. In addition once achieved, such innovation is transitory if school 1E is anything to go by.

Secondly LEA1, in this study, can be seen as a model of favourable circumstances leading to some uptake in a number of departments. Fig 7.9 gives the picture. LEA 2 on the other hand was quite the reverse. There was a lack of activity, lack of teacher interaction and wider perspectives, problematic advisory support, a number of declining schools and Sam Mars critique in chapter 7 makes these points at greater depth.

A key difference between the two LEAs has been the advisory support in each. I have attempted to summarise the differences in fig 8.1. Suffice to say that Tom David and Paul Gomer were influential and active actors who were energetic, ambitious and knowledgeable, with wide perspectives. They worked well together, appointed their own advisory teachers and were strong proponents of IT across the curriculum. In particular Tom David supported the secondment of senior geography teachers to undertake MAs in Geography Education and planned curriculum development through his heads of geography group and set up a number of CAL geography meetings (fig 8.2). Probably not unimportant was that both Tom David and Paul Gomer rapidly became senior managers within the LEA with consequent increased power and resources. An underlying factor to do with IT in LEA 1 is that the Assistant Director of Education strongly supported the innovation, again from a position of power. What I find intriguing is that heads of geography whilst generally appreciating the role of Tom David did not, in interview, point to him or the LEA as being particularly influential in encouraging change. Perhaps the positive environment for change created by these advisers had a positive yet subconscious impact on the takeup of this innovation?

A further observation is that I observed only one 'united' department in all my interviews, that is united in the sense of working constructively together to bring about curriculum development. A good many divisions existed and usually there was only one proponent of CAL geography, if at all, and he/she found it difficult to encourage departmental colleagues to take up the innovation.

Fig 8.1 Contrasting Roles of LEA Advisers (based on interview transcripts)

LEA 1

GEOGRAPHY Important facilitating/energetic role of Tom David. Strong support of geography teachers especially works with HoDs as management strategy. Links across with Paul Gomer. Both risen in seniority fast. National perspective (NCET courses) plus previous links with MEP and N. East (S Tyneside). Behind several IT courses organised for geography teachers. Encourages innovation, (eg Fieldwork with staff - CDC established by him)

IT - Paul Gomer - critical/stable/powerful role - link with Saul Jacobs and geography . Helped give IT a high priority within LEA. Long role in LEA. Vision strong and clear from start. Written down policy. Assistance of A Shallcross. Wide perspective/involvement beyond LEA1.

ATs - Martin Moseley - strong links with David and Gomer. Becomes adviser. Author of *Learning Geography with Computers Pack*. Variety of strategies for INSET. Indefatigable!

Overall - Senior LEA official convinced. Whole range of meetings and courses over years. Problem caused by the early meeting. Still several negative school based gatekeepers. Experienced teachers, several of whom have taken an MA and are used to CD. Innovative environment eg Fieldwork/Channel Tunnel initiative etc.

AT = Advisory Teacher;
CDC = Curriculum Development Centre;
CD = Curriculum Development;
TC = Teachers Centre;
AUCBE = Advisory Unit for Computer Based Education;
CS Computer Studies

LEA 2

GEOGRAPHY. Gail is the general adviser. Too stretched elsewhere, for example responsibilities for TVEI/Profiling/Curriculum. Deryn and geography teachers group declining and lacks status and power. Gail hasn't a grip on what's going on. Ignorant of CAL developments - see questionnaire to humanities teachers. Kate Morse/Paul Chapman have problems because of legacy of neglect and attempts to impose humanities. Del Goddard - powerful but not ally of IT across the curriculum. Advisers and Del pull against one another. Too complex a CD/INSET system?

IT. Sidney Boyce - near end of his career. Mainly maths background. No time/use for AUCBE. Obsessed by CS and hardware. Ignorant of IT developments. Link with local Polytechnic counterproductive. Lack clear policy. Boyce claims he is not supported resource wise within LEA. Lacks vision re IT across curriculum. Peter Evans similar.

ATs. Line of CS type people appointed - links with Polytechnic: Jane Bennett; Marlene Southern - how effective? - My ITT experiences and use of INSET Pack suggests ineffective.

Overall - geography and IT poorly served by advisers. Not an LEA priority. IT marginalised in isolated TC. No 'ear' of senior LEA officer for IT within LEA. Traditional 'culture' of borough?

Fig 8.2 Meetings for Geography Teachers in LEA 1 to do with CAL Geography

Dates and Venues	Nature of Meetings
November 22 - December 21st 1982. Teachers' Centre	Circus of software made available through Capital Region of MEP. 15 geography programs on show
November 24th 1982 4.30 pm Teachers' Centre	Hosted by Tom David with unsuccessful demonstration by Neil Pope .30 attended.
November 1984 Teachers' Centre	HoDs meeting. On Martin Moseley's initiative a CAL group established.
January 23rd 1985 Teachers' Centre	Ros Wilton introduced some ILEA work on CAL and there was an open discussion on aims of LEA 1's CAL group. Both Arthur Sterling and Tom David attended.
February 26th 1985 Curriculum Development Centre 4.30 pm (CDC)	Very low attendance because of postal problems. Martin Moseley, Tom Davies, Tom David plus 3 geography teachers.
Summer 1987 3 day course at CDC February 1988 at CDC	Details not known. Tom Davies attended. 1 day INSET on Domesday Project led by Tom Davies.
February 10 then July 5th 1989 at CDC	21 teachers attended in February and July. In between half day available for pairs of teachers to evaluate others IT work.

I did find a clear-cut rhetoric-reality gap, a phrase much used by Stenhouse. Most interviewees spoke highly favourably of the strengths of CAL geography but scrutiny of their departments' activity suggested generally low levels of the same.

I found the application of and indeed creation of models a useful device for furthering my understanding of the process. In particular I found my categorisation of actors (fig 6.9) helpful in understanding the dynamics of departments. The force-field models showed how change in departments was constant and the change processes complex. This was reinforced by drawing line graphs of activity over time. Finally the decision making models pointed to the detailed uniqueness of departments.

This study, I trust, takes further our understanding of the change process but there needs, in my view, to be more such case studies of the innovation process, preferably longitudinal and at the departmental level. In particular I feel the models I developed, that is the typology model (fig 6.9), the force-field model (fig 6.10) and the decision making process model (fig 6.25) could be applied to other situations. I totally concur with Roberts in her argument that, 'The in-depth study of particular cases offers enormous potential for increasing our understanding of geographical education', (Roberts, 1996, p.148).

Such research must help us all to understand change rather better than we do at present and hopefully will further encourage curriculum innovation in our schools. It is my hope that this research if read by advisers, heads of department and particularly teachers may help them to 'get good at change', (Fullan, 1991, p. xiii).

Appendix 2.1 Research in Computer Assisted Learning

W. Ashley Kent

Introduction

Few geography teachers, as yet, integrate computer assisted learning (CAL) with their day to day classroom teaching. Many are unaware of the increasingly wide range of possible ways in which microcomputers can support the learning process. Common feelings are that microcomputers (micros) are limited to statistical work and are an unnecessary and expensive irrelevance in the geography classroom. This is partly the result of poor communications by those involved in CAL geography but is mainly a direct result of the early stage of development of this new teaching resource and medium. The hardware has only just arrived in many schools and software is limited in quality and quantity. In a world used to quick answers/solutions many geography teachers are frustrated by the software available to them and perhaps have expected too much too quickly.

The stage of development of CAL geography varies across the world. A recent IOU newsletter (1981) encouraged geographers to become involved in educational research into CAL but the response has been limited. In most countries there are isolated individuals working in this area (e.g. Forer, 1978) but few coordinated developments, to this author's knowledge, occur within or indeed across national boundaries. At the influential National Educational Computing Conference (NECC) held in Kansas City, USA in June 1982, it was obvious that computer literacy was the prime concern of the 1500 or so conferencees. Social studies and geography teachers were in a tiny minority, quite clearly swamped by computer studies teachers. This was reflected in software available which for geography was very rare and where it did exist was of a 'drill and practice' type. International contacts between geographers concerning CAL are

at present very limited. It is hoped that the conference held in April 1983 at the University of London Institute of Education on 'CAL in Geography' will have been the first of many efforts to formalize international debate.

Probably the UK is as advanced as any other country in CAL geography for three reasons: firstly the funding in the 1970s of the National Development Programme in Computer Assisted Learning (NDPCAL) which spawned OAPE (Geographical Association Package Exchange); secondly the funding since 1972 by the Schools Council of the Computers in the Curriculum Project; and thirdly and probably most influential, the British Government's funding of the MEP (Micro Electronics Education Programme) scheme as well as the Department of Industry's scheme to put a 'micro' in every school. This has led to the development of a range of software, in the vanguard of which are the two major publishers, Heinemann and Longman. Alan Hill (1981) argued when reporting on the World Conference on Computers in Education held in Switzerland in 1981, that "the British educational contribution was pre-eminent, not only in the discussion sessions, but also in the demonstration of software. The most crowded and popular display was in the room which housed both the Computers in the Curriculum unit of Chelsea College and Rosemary Fraser's ITMA (Investigation on Teaching with Microcomputers as an Aid) unit from the College of St. Mark and St. John. Chelsea College were showing the various programs in the forthcoming Phase Two of their project - formerly funded by the Schools Council, and now by MEP. Their programs, together with those of ITMA were a clear dimension ahead of anything else on display. Also the literature for teachers in the UK is growing rapidly from an admittedly small base. The important early contribution was by Shepherd et al (1980) and various others have followed (Kent, 1983, Hall et al, 1982 Kent, 1982). Equally the amount of educational research into CAL geography is greater in the UK. All this explains, along with the author's British

residence and experience, why this chapter relies on exemplars from the UK.

The need for research

The need for research into CAL is clear. As was argued in a recent issue of CAL News (Kent, 1982), 'The signs are that there is an awakening to the vital need for such educational research. Individuals (and a few teams such as ITMA) are beginning to come to grips with a range of important research questions, such as: How effective is this software for pupils? What are student attitudes in general to computers and in particular to CAL? What makes for an effective training programme for teachers? What are the barriers to this curriculum innovation? What are the most effective uses of the microcomputer in the geography classroom? What management style of CAL is appropriate.'

The need for research is particularly urgent at a time when there has been a great rush to produce programs because of various political, social and economic pressures. Software developments, as yet, have benefited little from the inputs of educational evaluations. Such a new teaching resource with its many exciting potentials necessitates careful analysis. However, such research as exists, it was argued by Shepherd et al (1980), 'leaves a lot to be desired, and largely because traditional methods of evaluation are difficult to apply to CAL.' Sakamoto et al (1979) commented that 'the systematic study of CAL materials from a formative viewpoint has scarcely been conducted.' Needless to say the major purpose of evaluation is to try and improve the quality of education by collecting information so that informed judgements can be made about CAL geography.

The author takes research to be the same as that defined by Mouly (1978):-
'Research is best conceived as the process of arriving at dependable solutions to problems through the planned and systematic collection, analysis

and interpretation of data. It is a most important tool for advancing knowledge, for promoting progress, and for enabling man to relate more effectively to his environment, to accomplish his purposes, and to resolve his conflicts'.

Some general research has been undertaken into CAL which has been of value to researchers into CAL geography. This includes work by CERI (1976) which evaluated the NDPICAL Project; the work of the ITMA team, in particular their use of SCAN (Systematic Classroom Analysis Notation) (ITMA 1979); and Laurillard (1978, 1980), whose research interests include pupil activity and language.

Most CAL geography research is ongoing and even completed work is relatively recent. The earliest piece of research was by Grummitt and that was in 1978. An up to date list of titles and status of research is listed at the end of this article.

Types of research in CAL

One way of grouping research studies on CAL geography is to use the following five categories:

- A. Classroom Studies
- B. Evaluation of Programs
- C. Resource Allocation and Management Policies
- D. Curriculum Development
- E. Teacher Training

The questions stated are the author's paraphrasing of the recently completed or ongoing research known to him. For the correct title, status and location of the research, the reader is advised to consult the list at the end of this article.

A. Classroom Studies

1. What are the differences in learning effectiveness between two contrasting CAL teaching styles? (Hassell, 1982)
2. What are pupils attitudes to CAL geography before and after CAL lessons? (Robinson, 1982)
3. How do teachers/pupils/micros interact in CAL geography classrooms? (Hall et al)
4. What are the particular benefits of CAL geography simulations? (Watson).
5. When a topic is taught traditionally and then by CAL, what are the learning differences? (Grummitt 1978)
6. What group work language is generated by the use of a micro? (Cummings)

B. Evaluation Programs

1. How valuable/effective are the GAPE programs? (Those developed since 1981) (Midgley)
2. What niches in school geography might CAL best serve? How does one develop and evaluate such programs? (Ramsay)
3. Hurtle and the Poverty Game. How successful are they in classrooms? (Abbott, 1980)

C. Resource Allocation and Management Policies

1. What is the local impact of the MEP? (Kent)
2. How have LEAs developed a policy on buying micros for their schools? (Burdett)

D. Curriculum Development

1. What is the knowledge of, and attitudes towards CAL geography by geography teachers in one LEA? (Freeman, 1981)
2. How, at the local and national levels between 1982-85, has the innovation of CAL geography been received by teachers? (Kent)
3. How far have geography teachers in three English regions adopted and changed attitudes towards CAL geography over a three year period? (Hall et al)

E. Teacher Training

1. What CAL provision is made in initial training and INSET for geography teachers? (Yaffe)

A further categorization of research can be according to:-

A. Scale of Consideration

B. Methodology

C. Techniques for Data Collection

A. Scale of Consideration

1. National e.g. Burdett, Yaffe
2. Regional e.g. Hall et al
3. LEA e.g. Freeman, Kent
4. Classroom e.g. Hassell, Robinson, Grummitt, Cummings, Abbott

B. Methodology

1. Summative e.g. Hassell, Grummitt
2. Formative e.g. Hall et al
3. Anthropological e.g. Kent, Watson
4. Agricultural/botany e.g. Grummitt

C. Techniques for Data Collection

1. Conversation and interviews e.g. Freeman
2. Questionnaires e.g. Kent, Burdett, Freeman
3. Video recording e.g. Hall et al
4. Audio recording e.g. Cummings
5. Analysing learning resources e.g. Midgley, Ramsay
6. Pupil assessment e.g. Hassell, Grummitt
7. Semantic differential e.g. Robinson
8. Classroom observation schedules e.g. Hall et al
9. Diaries e.g. Kent
10. Course and program evaluation proforma e.g. Yaffe, Watson
11. Longitudinal e.g. Hall et al, Kent

At first sight this is an impressive array of research but arguably this is deceptive. All rigorous educational research has to limit it's focus of consideration and these are no exception especially as about half represent first or second (M.Ed, M.A.) degree work not the usually more extensive and original M.Phil. or Ph.D. research. Many gaps remain.

Of the fifteen pieces of research mentioned here, nearly three quarters (9) are in the classroom studies or evaluation of programs categories.

This reflects the most immediate needs of geography teachers now. Indeed most of the researchers in these categories are practising teachers who are engaged in action research to do with the present use of programs in the classroom. Only three studies, to the knowledge of this author, are of the curriculum development category. This contrasts with the 34% of all research studies listed by Corney (1982) which deal with curriculum planning or processes of curriculum development and influences on change in geographical education.

A particular problem of research into CAL is the remarkable pace of change in both software and hardware developments. In a sense this makes all research date rapidly. This is especially true of software evaluations since by the time the study is complete the software in question may have been superseded. There is a clear need here for educational research into CAL to be effectively and quickly relayed to key decision makers. At present this rarely happens and as with other educational research dissertations rapidly gain dust in libraries.

Another problem with such research, at present at any rate, is the difficulty of access to classrooms and teachers. On the one hand only a few innovative teachers are using CAL in their classrooms and even they understandably find the intrusion of an evaluator worrying. (e.g. video film and the research of Hall et al). On the other hand many teachers though interested in these developments find them confusing and disconcerting. They will cooperate with researchers but feel pressured (by the press? by their colleagues? by their advisers?) to comment favourably when they may have severe reservations. Getting at their real attitudes is intractable.

The future needs for such research are relatively clear. Firstly and very important is the need to coordinate and exchange information on the rapidly growing research which is being undertaken. In the UK at any rate a start was made in 1982 when the author instigated a series of research seminars to be held yearly at the London, Institute of Education. A similar initiative was taken with regard to members of the IGL. Secondly the work of the MGP and generally the UK government's role in CAL, cries out for further research work. Thirdly more and more teacher evaluators/researchers are needed to widen the range of classroom and program based evaluations as this new medium begins to take off. Finally a plea is made for more 'soft' research the findings of which need to be made known more rapidly and efficiently than

Equally the majority of CAL geography research could be said to be positivistic social science relying on questionnaires, structured interviews, setting up experiments and 'objectively' observing and describing phenomena. As Cohen and Manion (1980) put it, the choice of research paradigm to be adopted is of crucial importance since it determines whether the researcher will 'identify certain issues as of interest to him and ignore others; he will ask certain questions and not others; he will adopt certain research methods rather than others; and he will show a preference for certain kinds of analysis, explanation and theory'. Data have different meanings according to the paradigm a researcher uses. On the one hand in positive studies, data are always data for some hypotheses or other whereas in interpretative studies, data are the source of hypotheses and interpretation. Research studies may be placed along a continuum between 'hard' and 'soft' research. Of course there is a danger here of artificially polarizing such research studies since many researchers adopt a pragmatic 'triangulation' approach whereby both soft and hard methods of data collection are involved. However it is felt that this categorization of research gives a further view of the range of such studies.

Certain issues arise out of such research into CAL geography. Proving whether a CAL geography lesson is better than another type of lesson is an unsolvable problem. Variables cannot be held constant in a true experimental fashion and probably more worthwhile are those researches focussing on the differences between different styles of CAL. Hassall's work is an example of this, but even here rigorous scientific method is difficult to implement. Similarly as in much other educational research there is probably an over-reliance on questionnaires though their validity and response rates suggests that this information they yield may not be reliable.

at present. Those interested in these or other possible future research directions in CAL geography should not hesitate to contact the writer.

Research Studies on CAL Geography

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Addresses of above researchers

Susan Abbott	University of Technology, Loughborough.
Frank Burdett	Department of Geography, University of Manchester
Bob Cummings	St. Mary's College, Twickenham
Simon Grummitt	St. John Rigby School, West Wickham
David Hall	School of Education, University of Bristol
David Hassell	Onslow School, Hatfield
Ashley Kent	Institute of Education University of London
Howard Midgley	Department of Geography, University of Technology, Loughborough
Tony Ramsay	The American School, London
Catherine Robinson	Collingwood School, Camberley
Deryn Watson	Computers in the Curriculum Project, Chelsea College, London
Patrick Wiegand	School of Education, University of Leeds
Leeley Yaffe	School of Education, University of Reading

Learning Geography with Computers

Since the late nineteen seventies, geography has been at the forefront of those subjects areas interested in developing the potential of computers in classrooms. Although research into computer assisted learning (CAL) in geography teaching has been piecemeal and limited to MA/M. Ed. level research, at least geography has benefitted from twice yearly held research seminars held at the Institute of Education over the last four years or so. These have generated a good deal of research exchange and are reflected in

the range of MA dissertations written since 1978. Most have focussed on classroom processes at work in CAL geography lessons, an understandable action research orientation for the experienced geography teachers who undertake the MA Geography in Education at the Institute.

Comparing strategies

Grummitt's (1978) work was a pioneering piece at a time of transition in CAL between mainframe computers and microcomputers. 'The main body of the study evaluated a particular computer program to see if its use was better than conventional methods for a particular learning situation.' The program studied was SPREAD, designed to simulate the diffusion process and this was compared with the 'lecture method' and the 'manual simulation' method. Each comparable group was taught by one of the three methods and 'the use of the computer in the classroom increased learning, but not retention, when teaching one particular geographical concept (spatial diffusion) to students of mixed ability at one particular age level.' However there were methodological problems with the research in that two teachers were involved and comparing such widely different types of lessons is difficult.

Hassell, (1982) also concentrated on lessons - in this case two lessons both taught using computers but adopting quite different styles. On the one hand there was the teacher centred style where the computer was used as an electronic blackboard with question/answer sessions dominating. On the other hand there was the student centred style in which children were organised in groups with the teacher as partner. 'The main part of this research is to take a critical view of the teachers style and the resulting outcomes, when it is developed in different ways with the same computer

package.' The two third year groups studied were undertaking a unit of work on population and the computer program used was PEOPLE. The groups exhibited similar intelligence characteristics. The group of pupils who were taught with a pupil-centred style achieved somewhat higher marks in a post test and were seen to become more involved in the lesson and to undertake more pupil-pupil interaction. The group of pupils also exhibited increasing interest in the computer led lesson as time passed whereas the reverse was true of the formally taught group.

A case study approach

Leonard, (1984) dispensed with this comparative approach and concentrated on a case study of a game simulation, RICE FARMING with a mixed ability group of third year pupils. His interests were in pupil talk, learning in groups, responses between different abilities and gender, and whether some pupils became alienated by the CAL process. Generally the experience seemed to cause an increase in understanding and motivation and in particular middle band pupils enjoyed the lessons. Pupil personality determined involvement of pupils in the lessons and as time elapsed the less able gained in confidence. Cummings (1984) in contrast focussed work narrowly on pupil-talk in groups during a CAL simulation game but widened the survey to five age ranges with one particularly in depth case study. Cummings believes in the value of 'free ranging pupil and student talk' and so used the game TREASURE ISLANDS as a rich stimulus for this. He analysed the various language attributes displayed between the pre and post tests applied but the major weight of the study was in the language analysis of 14 audio cassettes of 90 minutes length and 1 video cassette of 120 minutes length. His findings are displayed as conversation component pie charts

for the bottom juniors, top juniors, first, third and fifth year secondary groups he studied. Keeping faith with case study methodology, he restricts his conclusions leaving much to the reader but he does suggest that the pupil-pupil talk advantages in conceptual/language development seemed to be confirmed in the research findings.

The affective domain

Robinson's (1982) research concentrated less on cognitive benefits of CAL and more on the affective domain. In her study of pupil attitudes towards CAL in geography she used the program MILL with three third year geography classes each with varying ranges of ability. In the pre and post tests (before and after the use of MILL) she included both a general attitude section and a specific section on pupils views on CAL in geography lessons. This quantitative data was supported by structured interviews with pupils and pupil essays. She discovered generally held misconceptions about what computers could and could not do even in the post test results. The majority of pupils held favourable general attitudes to computers before and after the experience, but some less able pupils developed negative attitudes by the time they completed the post test. Ability seemed to be the key independent variable affecting pupil attitudes to CAL since the least able group showed consistently unfavourable attitudes to MILL. 'It was concluded that there was an obvious need to modify both the teaching strategy and the program to suit the different needs of different children.'

Computers support for fieldwork

Lawler, (1986) directed his attention to the ways in which computers can support fieldwork and in particular, 'to evaluate how a group of 14/15 year

old geography students made use of microcomputers to aid their analysis of raw fieldwork data.' The fieldwork data was gathered from a day trip to the Devil's Punchbowl with the intention of testing a variety of river related hypotheses. This accumulated data was subsequently described, and analysed using ILEA's BARCHART and LINES programs alongside the FIELD STUDY TECHNIQUES software. Lawler adopted an illuminative style of evaluation which included pre and post fieldwork questionnaires, audio and videotapes of classroom work, interviews with students and staff and observations of classrooms by teachers. Unfortunately the computer, 'did not realise its full potential as an 'emanicipating' device because of a need for less complicated, user-friendly programs'. The impression conveyed was of a reduced enthusiasm for fieldwork (a wet miserable day was experienced) and for the use of computers in geography (need for improved software?).

CAL and teacher training

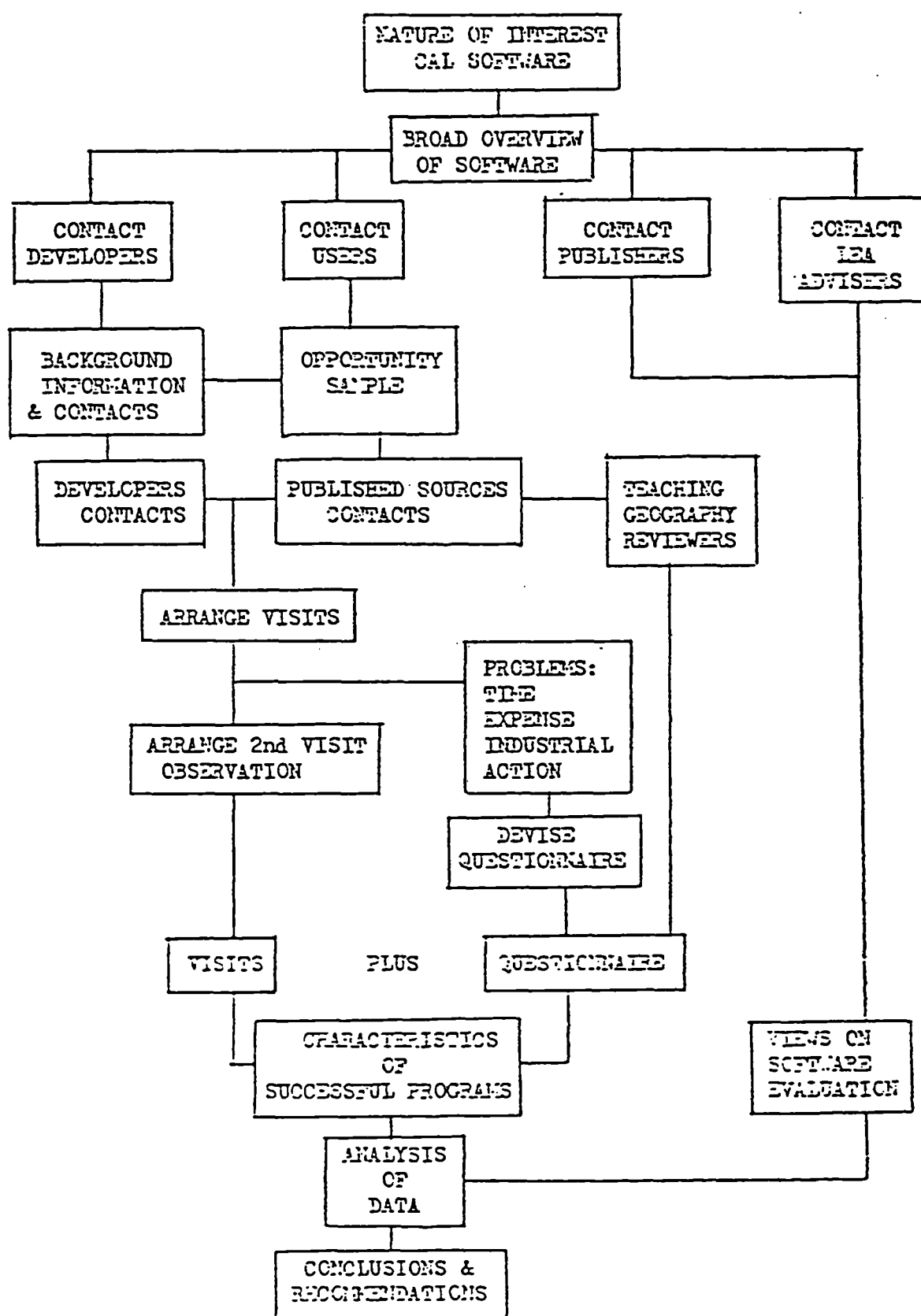
Freeman's (1981) and Cracknell's (1985) researches focussed on the attitudes, actions and training of teachers in the use of the new technology. Freeman's work proved to be a forerunner of several similar researches (e.g. Dove (1987) and Rogers (1987)) in which teachers were quizzed by questionnaire and interviews about CAL in geography. Freeman for Hertfordshire found that 20% of respondents had used CAL in geography lessons especially at the 16-19 level. The attitude survey showed users and non users were similar in that 'both groups were aware of and showed a positive attitude to the role and contribution of CAL in geography'. From the questionnaire and interview results, Freeman developed a descriptive model of decision making behaviour adopted by geography teachers to CAL.

Her policy recommendations centred on a case for a local/regional network of information and service to teachers. Personal commitment achieved reality with Freeman becoming employed by an MEP regional centre which of course carried through such a recommendation! As she argued, 'the regional networks could provide the missing link between institutionalized national projects and the teachers themselves'. Is there a lesson here for all curriculum developments? Cracknell's (1985) main objective in relation to teacher training 'was to see if a short series of INSET sessions for non CAL users can provide the confidence to use computers in teaching'. Having surveyed Cambridgeshire geography teachers, he identified seven keen but unaware 'guinea pigs'. Bearing in mind prior experience in INSET to do with CAL geography he set up a course of four (carefully structured) sessions. Cracknell interviewed the participants both during the INSET and three months later. His recommendations included the development of a computers across the curriculum policy for each school, courses to be run if possible during the day with confidence building a key objective and the need for regular meetings of geography CAL users through an LEA coordinator. Finally he recommended the appointment of teams of CAL advisory teachers supporting humanities teachers. This strategy has been recently put into practice by the government with the appointment in 1988 of hundreds of Education Support Grant (ESG) advisory teachers encouraging CAL across the curriculum!

Evaluating software

Thomas (1985) concentrated on software evaluation and devised a comprehensive and systematic research design (fig. 4.5). Through a questionnaire to pupils and teachers seeking views on software used, school and classroom visits and observations and correspondence with publishers

Fi. 4.5 THE FINAL RESEARCH DESIGN



(Thomas, 1985)

and advisers, Thomas gained some new insights into the 'customers' views on software. He concludes by listing the characteristics of 'successful' programs in the view of pupils and teachers, and suggests ways in which program evaluation can be extended and improved.

Satellite Imagery

A further area of the new technology which geographers are beginning to exploit is that of satellite imagery. Universities have taken great strides in incorporating remote sensing into their geography courses but schools have taken on this innovation rather slowly.

The Earth Resources Technology Satellite or Landsat and its potential for geography education has been researched by four MA students at the Institute of Education between 1978 and 1985. Smith, (1978), studied the qualities of satellite imagery which 'enables environments from local to regional scales to be analysed in considerable detail'. He felt that such imagery offered a 'different perspective of phenomena from conventional material and as such could form the basis of a modified approach to the geographical enquiry model.' Smith explored the potential of Landsat imagery for various 'Earth Resources' disciplines as well as (see fig. 4.6) for secondary school geography by looking in particular at how such images could be used in the teaching of the London 'A' level syllabus. He also investigated pupils' ability to observe and recognise features in Landsat photos and showed that in general they could cope. He also incorporated Landsat images into a third year course on agriculture. The pupils preferred the use of these images and felt they provided valuable extra information in addition to OS maps and air photos. He ended by making a

Fig. 4.6

Summary of applications of Incident Data in the various Earth Resources Disciplines

Agriculture, forestry and range resources	Land use and mapping	Geology	Water Resources	Oceanography and marine resources	Environment
<p>(1) Discrimination of vegetative types:</p> <p>Crop types</p> <p>Timber types</p> <p>Range vegetation</p> <p>(2) Measurement of crop acreage by species</p> <p>(3) Measurement of timber acreage and volume by species</p> <p>(4) Determination of range readiness and biomass</p> <p>(5) Determination of vegetation vigor</p> <p>(6) Determination of vegetation stress</p> <p>(7) Determination of soil conditions</p> <p>(8) Determination of soil associations</p> <p>(9) Assessment of grasses and forest fire damage</p>	<p>(1) Classification of land uses</p> <p>(2) Cartographic mapping and map updating</p> <p>(3) Categorization of land capability</p> <p>(4) Separation of urban and rural categories</p> <p>(5) Regional planning</p> <p>(6) Mapping of transportation networks</p> <p>(7) Mapping of land-water boundaries</p> <p>(8) Mapping of wetlands</p>	<p>(1) Recognition of rock types</p> <p>(2) Mapping of major geologic units</p> <p>(3) Revising geologic maps</p> <p>(4) Delineation of unconsolidated rock and soils</p> <p>(5) Mapping igneous intrusions</p> <p>(6) Mapping recent volcanic surface deposits</p> <p>(7) Mapping land-forms</p> <p>(8) Search for surface guides to mineralization</p> <p>(9) Determination of regional structures</p> <p>(10) Mapping linears (fractures)</p>	<p>(1) Determination of water boundaries and surface water area and volume</p> <p>(2) Mapping of floods and flood plains</p> <p>(3) Determination of areal extent of snow and snow boundaries</p> <p>(4) Measurement of glacial features</p> <p>(5) Measurement of sediment and turbidity patterns</p> <p>(6) Determination of water depth</p> <p>(7) Delineation of irrigated fields</p> <p>(8) Inventory of lakes</p>	<p>(1) Detection of living marine organisms</p> <p>(2) Determination of turbidity patterns and circulation</p> <p>(3) Mapping shoreline changes</p> <p>(4) Mapping of shallow and shallow areas</p> <p>(5) Mapping of ice for shipping</p> <p>(6) Study of eddies and waves</p>	<p>(1) Monitoring of surface mining and reclamation</p> <p>(2) Mapping and monitoring of water pollution</p> <p>(3) Detection of air pollution and its effects</p> <p>(4) Determination of effects of natural disasters</p> <p>(5) Monitoring environmental effects of man's activities (lake eutrophication, defoliation, etc).</p>

(Smith, 1978)

plea for the incorporation of satellite images since after all, 'our geography syllabuses should reflect our modern society'. He continues, 'to date there has certainly been a slowness, if not reluctance to integrate satellite based studies into secondary school education satellites are environmental data collection platforms of great potential and versatility and their involvement in the school geography curriculum can only grow.'

Pettit, (1980) investigated the interpretation of Landsat false colour imagery by young secondary children. The 11 year olds studied were from a rural school in Hampshire and were split into three groups given varying tuition and then tested on their recognition of a variety of features. The findings suggested that the majority of pupils found the images interesting and enjoyable to work with and the false colour effect not confining; boys apparently performed better than girls on the directed search and lesson tests; and the main perceptual problems related to vertical perspectives and the scale of features. Finally he argued that instruction in false colour appears to be a relatively simple and effective method by which pupils can be sensitized to images.

In a not dissimilar study Whiteman (1982) studied the relative influence of false colour and monochrome Landsat imagery in classroom geography. He concluded as a result of testing 200 pupils from a boys comprehensive school in East London that, false colour imagery is more readily interpreted than comparable monochrome imagery and a geography teacher 'must consider a number of factors when selecting images including the age, ability, geographical experience of the pupils and the size, scale, nature

and format of the images to be used.' Smythe in 1985 continued this research tradition by establishing whether Landsat imagery was readily understood by 125 geography pupils from the 12-15 age range bearing in mind year, band, sex, IQ and whether natural colour imagery was better understood than false colour imagery. He argues that, 'providing a natural colour format is employed by those producing Landsat materials for schools then Landsat imagery will be too powerful a teaching tool to be kept out of the classroom' but as yet, 'the potential as yet remains unrealised' (The experience of the Landsat module he devised enhanced the skills of the pupils but boys still scored higher than girls).

Goldschneider, (1981) in contrast studied the value of air satellite photography to the teaching of climatology, meteorology and weather studies. He was aware of the conceptual and perceptual problems involved in air satellite photography work but believed in the consequent teaching advantage and through his research was seeking 'conclusive evidence' of these. He concluded from pre and post tests completed by 200 pupils that air satellite photographs were a suitable resource for teaching about weather and climate and although pupils did find the images difficult to understand given a satisfactory curriculum framework alongside teacher guidance, he felt that the requisite knowledge can be developed in the pupils.

Appendix 2.3 A Survey of Computer Usage and Views on CAL Among Secondary School Geography Teachers

Roderick Allen

Cambridge University Dept. of Education

Recent government initiatives such as the £10M "Technology for Better Schools" scheme, which is designed to train more advisory teachers in the new technology, and the emphasis in the National Curriculum on teaching Information Technology through the Foundation Subjects, including Geography, have served to focus attention on the current state of Computer Assisted Learning (CAL) in our schools. This makes particularly topical and interesting the results of a questionnaire forming part of research into CAL undertaken at the Cambridge University Department of Education. It was administered to a hundred Geography teachers from secondary schools (93% of respondents) and sixth form colleges (7%), mainly in the South East and East Anglia, during April and May 1983. Both maintained and independent schools were covered, and there was a reasonable sampling of both sexes and all ages. The questionnaire generally entailed ticking the appropriate response, but there was also space for additional comments.

One thing the survey cannot show is the extent of computer usage in absolute terms, because completion of the questionnaire was voluntary, and presumably those who did not use computers would be less likely to fill it in. However, of respondents who had used computers in their lessons during the preceding year, 54% used them for less than six lessons and 23% used them for 6-10 lessons, a less polarized distribution than that reported by Kent (1984, p.143). Only 12% had used them for more than 20 lessons. Whilst it is not possible to say whether or not a higher proportion of teachers in independent schools use CAL, where they do use CAL they use it more than those teachers in maintained schools who use CAL, being three and a half times more likely to use it for more than twenty lessons a year.

Of lessons involving CAL, 59% used only one computer, whilst 41% employed several. Although the Fourth and Fifth Years (36%) and the Sixth Form (33%) were the main classes to use CAL for Geography, 30% of CAL lessons were with junior secondary pupils in Forms 1 to 3, a change from the overwhelming preponderance of use at Sixth Form level reported by Freeman (1983).

The programs used with pupils were analysed according to type, and the results are shown in FIGURE 1. There is no scale on the diagram because the figures are relative rather than absolute, the bars representing the proportion of the total number of uses reported by respondents. The same data when analysed according to the topic for which the program was used, produced FIGURE 2, where the bars again represent the proportion of the total number of uses reported by respondents. Most of the "Other" topics shown in the diagram involved wordprocessor programs, so presumably they were used for general note-making and essay-writing which respondents found impossible to classify.

Combining the type of program with the topic involved, produces the pattern in FIGURE 3. This shows that the most frequent CAL lessons involve an "animated blackboard" demonstration in geomorphology, "tutorial/drill and practice" programs for mapwork, and statistical/quantitative calculation packages for both fieldwork/projects and for geomorphology. Wordprocessors are also popular for fieldwork reports, projects and other writing tasks, purchased data files are mainly employed in connection with population and settlement, whilst "animated blackboard" demonstrations are also well used for teaching about weather and climate.

When asked about the use which the teachers themselves made of computers either for administrative purposes (such as pupil record keeping) or to prepare pupil materials, such as worksheets or project booklets, the most striking fact to emerge was the extensive use of word processing, as FIGURE 4 shows. Forty-eight per cent of respondents used wordprocessors for one or both of these purposes, including 6%

who did not use computers at all with pupils.

When asked about the problems of using computers in the classroom, the main difficulty, mentioned by 70% of respondents, was access to the hardware. Several teachers said that the computers in their school were in a special room and were used almost continuously by pupils doing Computer Studies, so that it was very difficult for teachers of other subjects to use them, a problem previously reported by Kent (1984, p.142). Only 16% of respondents had no difficulty getting access to the hardware. The second major problem was the cost of software, mentioned by 64% of respondents; only 15% saw this as no problem. Almost 60% of respondents thought that using computers is too time-consuming, in marked contrast to the claim of Hall (1982) that learning time is reduced by 40% - 50% when compared with traditional methods. Over half felt they lacked sufficient knowledge about using computers, though a number indicated that they were taking steps to remedy the situation.

Nearly half of respondents felt that publishers do not produce suitable software, and 45% pointed to a lack of appropriate software in their particular school, so things have not improved much since Shepherd (1983, p.54) reported similar deficiencies five years ago. However, lack of information about programs available was less of a problem, being cited by 36% of respondents. A similar number thought that computer games are entertaining but do not actually teach much, a view which Berg (1985, p.138) also found common amongst educators in the United States. It is a tribute to the reliability of modern hardware that computer breakdowns were seen as a serious problem by only 4%; many more were frustrated by the incompatibility of software between different models owned by the school.

Unexpectedly few respondents had ever used software produced or sponsored by commercial or industrial organisations. None had used software from the Atomic Energy Authority, the Electricity Board or British Telecom. Only three had used British Gas programs, the same number had used Shell productions, and one had used a Conoco pack. The most popular sponsored software came from B.P., which had been used by eleven respondents. Users were roughly evenly divided between those who thought that sponsored software was about the same quality as software produced by educational publishers, and those who felt it was marred by hidden advertising or "propaganda".

When asked to comment from their own experience on the effectiveness of computer games and simulations, they were said to be best for increasing pupil interest and motivation (74% of respondents rating them very effective or fairly effective), which confirms the findings of Taylor and Walford (1978, p.28) and Bredemeier and Greenblat (1981) in relation to non-computerised simulation games. Their next most effective area was perceived to be developing problem-solving and decision-making skills (69%), as postulated by Blachford (1975), who pointed to "a growing consensus as to the value of simulation games in teaching about decision-making processes, the factors that impinge on decision-makers and the consequences of decisions". Also high on the list were teaching and practising geographical skills such as mapwork (65%), and improving pupils' attitudes towards computers (63%). The former contrasts with Blachford's (1975) assertion that "there is no special power in simulation games to ensure the development of ... skills", but the latter confirms the conclusions of Bracey (1982).

There was then quite a drop in the ratings to the next cluster of tasks, where computer games and simulations were seen by most to be "fairly effective" rather than "very effective". These were: providing insights into the real world, improving retention of information by pupils, teaching higher level concepts, and imparting knowledge of facts. These opinions confirm the findings of several studies, summarised by Greenblat (1982) and Berg (1985), that simulation games in general are no more or less effective in enhancing cognitive learning than other methods of teaching, and that whilst they appear to produce better retention than other methods, this point has never been substantiated for computer-based games. However, respondents in the present survey also rated computer games and simulations as being only "fairly effective" at improving skills in communication, negotiation, persuasion and compromise, in contrast to Blachford's (1975) claim that simulation games in general are "almost uniquely valuable" in developing these skills. The difference may lie in the fact that most computer-based games involve less of the peer interaction which seems necessary for the promotion of these social skills.

The lowest cluster of ratings, where less than 30% thought computer games and simulations "fairly effective" and less than 10% thought them "very effective", consisted of their ability to develop confidence in dealing with the world, to develop tolerance, understanding and empathy for other people/other viewpoints, to shape attitudes and values, and to promote moral development. For this last aim, a third of respondents thought computer games totally ineffective.

This lowest cluster is rather disappointing. The opinions expressed by respondents would tend to support Scarfe (1971, p.200), who believes that "players do not exhibit an increase in a feeling of mastery over the environment", rather than Kasperson (1968, p.420) and Gordon (1970), who argue that simulation games can develop a pupil's confidence to deal with reality. Blachford (1973) maintains that such games can also develop empathy for other people, and Kenniston (1970) asserts that they can contribute to the moral development of pupils through discussions of the issues raised and by compelling them to play roles and defend positions that are alien to them. He suggests that moral development can be assisted both by a pupil discovering corruption and hypocrisy in the world, and also by his being made aware of his own potential for corruption, as for example when taking the role of a manufacturer in a simulation, he has to dispose of waste products. Sander (1972) cites experiments involving such conflicts and follow-up discussions, in which secondary pupils showed a measurable gain in moral judgement of one stage relative to control groups, and maintained this a year later.

It is true that these writers were referring to games and simulations generally, rather than to computer games and simulations specifically. Nevertheless, good computer games and simulations (like "Sandharvest") should really be at least equally well able to achieve all those aims, and it is perhaps a sad reflection on the trivial focus and mechanistic outlook of game writers, and the restricted imagination of the teachers using them, that they are not seen as vehicles for developing confidence, empathy and values. Many respondents in their comments on other sections, emphasised that the learning outcomes of using computer programs are very dependent on the way the teacher uses them and the context in which they are set. Surely there is much scope for producing games and educating teachers in how to use them so as to develop these attitudes in pupils. For example, one or two respondents, whilst maintaining that computer games could not be used to promote moral development, complained that their pupils took great delight in "playing God" and competing to kill as many peasants as possible.

Closely related to the skills, attitudes and values in the lowest-scoring cluster just discussed, is the element of competition in computer games and simulations. Half the respondents thought this was a good thing, primarily because it motivates pupils but also because it reflects real life; but a quarter thought it potentially harmful, mainly because defining "winning" in terms of acquiring the most land or profit is an undesirable definition of success to foster, and because teachers should encourage co-operation and collaboration. However, 40% of respondents felt that even though competition between groups or teams of players might be undesirable, this was balanced by the fact that there is collaboration between members of the team, and many commented that much depends on the way teachers use the game and debrief after it. As Blachford (1975) points out, many games have degrees of "winning", rather than "winners" and "losers", and part of the effectiveness of simulation games is that, unlike the situation in the conventional classroom, the element of competition is integral to the game, adding to the realism and the fun of playing, rather than being an artificial construct designed for the purposes of ranking pupils, with all the disadvantages which arise from that, such as a decrease in the motivation of pupils who are consistently low-ranked (Block, 1971, p.20-22). This probably explains why only one in eight respondents in the present survey thought competition harmful because of the negative psychological effects on the losers, and why several others made a point of debunking any such suggestion, saying that in their experience even the losers enjoyed playing, and that particularly where they had been playing a role and where debriefing was carried out sensitively, pupils did not mind whether they won or lost.

The vast majority of respondents agreed that virtually all economic geography simulations are set in a capitalist framework and imply acceptance of free enterprise. Fifteen per cent of them thought that this would help to prepare pupils

for a job in commerce and industry. However, nearly a quarter thought it unsatisfactory because such simulations fail to show society as fundamentally changeable and to give cues for change, a criticism made by Langeveld (1985, pp.35-36), who argues that computer programs, like textbooks, do not sell if they contain a critical analysis of power relations which makes pupils seriously doubt aspects of their own society. He cannot "see any hope for software that helps the student think in alternative ways that really count. ... We will have a highly advanced technology working with most mediocre kinds of program ... if we look at it from a socially creative and imaginative viewpoint." Presumably because they were Geography teachers, rather more respondents found the restriction to a capitalist framework a disadvantage because it does not enable pupils to understand the socio-economic motivations in communist countries, Asian peasant economies, etc., though some 40% of respondents felt that this does not really matter, because in debriefing after a simulation the teacher can introduce scenarios for these alternative economic systems.

A recent Delphi Study (Allen, forthcoming) has suggested that escalating costs may reduce the amount of software produced specifically for the educational market, and that schools will use more programs designed for use in business (e.g. spreadsheets) or for industrial training. When asked to consider this possibility, the most significant reaction was that this would be a useful way of spreading the cost of acquisition because content-free programs such as word processors and databases can be used in several subjects (49%). Other advantages highlighted were that such software is value-free, thus making it easily adaptable to classroom use (36%), that commercial software will train pupils in some of the skills they will need for a career in commerce and industry (35%), and that programs will be more related to the real world (24%), though nearly as many disagreed with this last proposition as agreed with it. The main drawback was felt to be that the content of programs produced for use in business or for industrial training is unlikely to fit into school syllabuses -- 30% thought this, though 20% disagreed. Opinion was equally divided on whether or not the values implicit in commercial software are appropriate to the classroom, but on the whole it was not thought that using business and industrial training programs would discourage pupils from developing a critical attitude towards commerce and industry.

This survey has shed some light on how the situation in schools has changed since previous CAL surveys were undertaken, and also on how teachers' experience of computer-based games and simulations compares with the findings of earlier research into non-computerised simulations. Its results should provide food for thought for educational planners in general, and for teacher trainers in particular.

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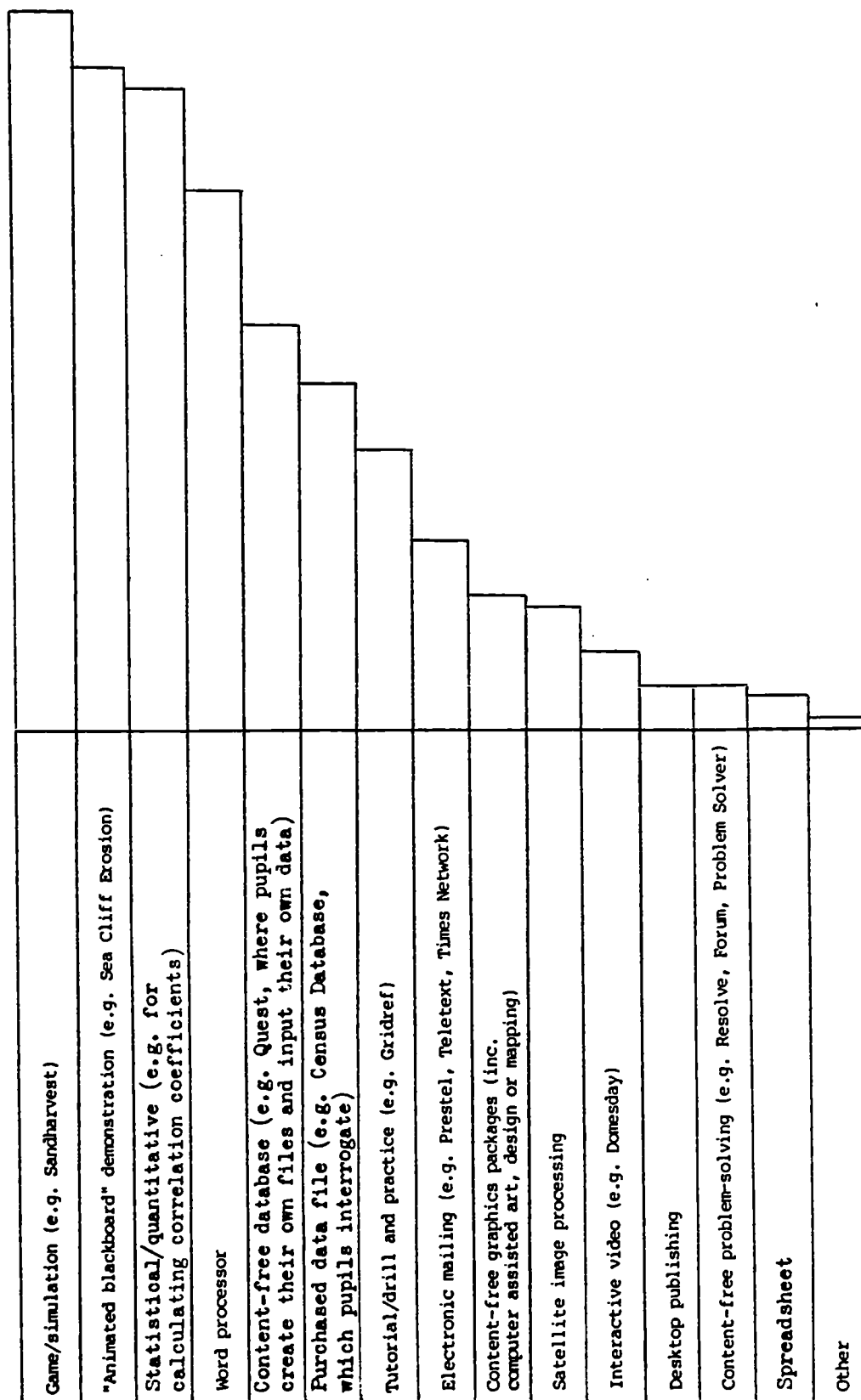
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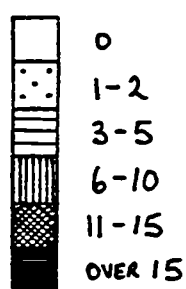
FIGURE 1 Computer Use By Type of Program



Geomorphology	
Pop'n/settlement	
Fieldwork/projects	
Weather/climate	
Mapwork	
Third World Devel	
Agriculture	
Transport	
Mining/manufact'g	
Other	

FIGURE 2 Computer Use By Topic Taught

	Geomorphology	Weather/climate	Agriculture	Mining/manufacturing	Transport	Pop'n/settlement	Third World Devel	Mapwork	Fieldwork/projects	Other
"Animated blackboard" demonstration (e.g. Sea Cliff Erosion)	■	■	■	■	■	■	■	■	■	■
Game/simulation (e.g. Sandharvest)	■	■	■	■	■	■	■	■	■	■
Tutorial/drill and practice (e.g. Gridref)	■	■	■	■	■	■	■	■	■	■
Purchased data file (e.g. Census Database, which pupils interrogate)	■	■	■	■	■	■	■	■	■	■
Content-free database (e.g. Quest, where pupils create their own files and input their own data)	■	■	■	■	■	■	■	■	■	■
Spreadsheet	■	■	■	■	■	■	■	■	■	■
Statistical/quantitative (e.g. for calculating correlation coefficients)	■	■	■	■	■	■	■	■	■	■
Word processor	■	■	■	■	■	■	■	■	■	■
Content-free graphics packages (inc. computer assisted art, design or mapping)	■	■	■	■	■	■	■	■	■	■
Desktop publishing	■	■	■	■	■	■	■	■	■	■
Content-free problem-solving (e.g. Resolve, Forum, Problem Solver)	■	■	■	■	■	■	■	■	■	■
Interactive video (e.g. Domesday)	■	■	■	■	■	■	■	■	■	■
Satellite image processing	■	■	■	■	■	■	■	■	■	■
Electronic mailing (e.g. Prestel, Teletext, Times Network)	■	■	■	■	■	■	■	■	■	■
Other	■	■	■	■	■	■	■	■	■	■



Percentage of respondents using given program type for given topic during the preceding year

FIGURE 3 Computer Use By Type of Program and Topic Taught

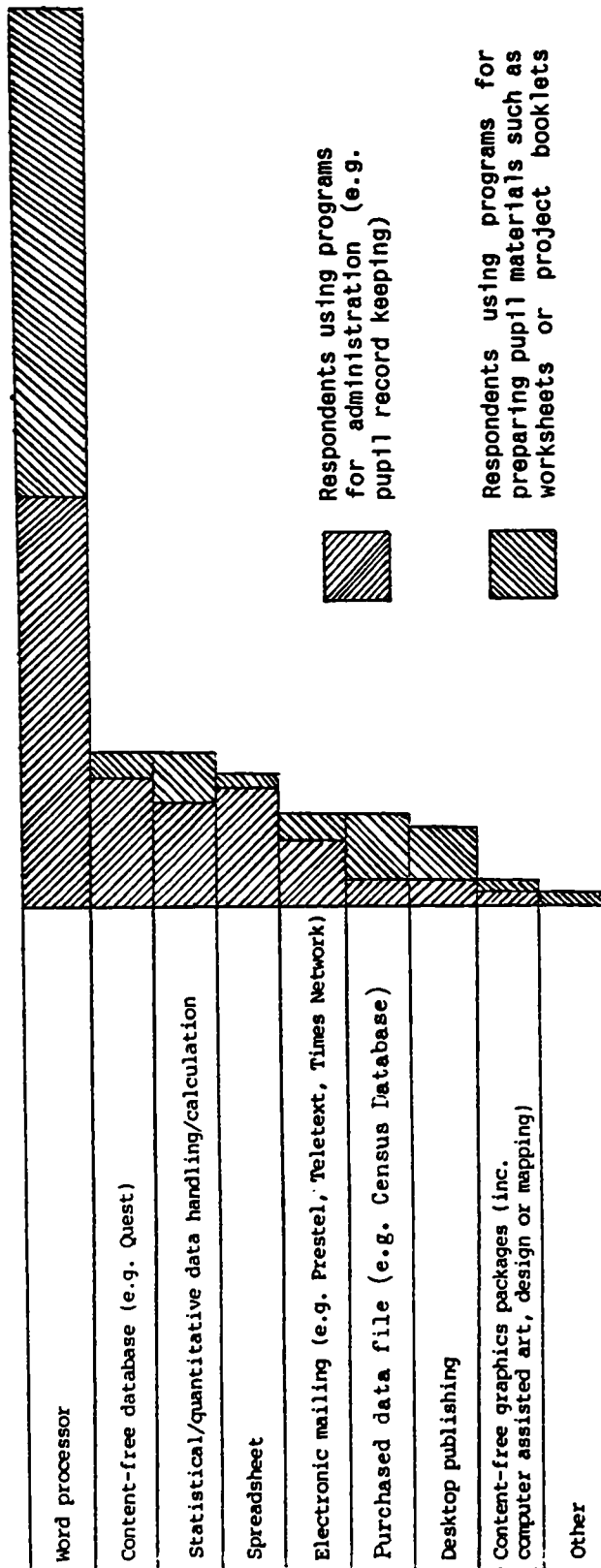


FIGURE 4 Computer Use For Administration and Preparation of Pupil Materials

Appendix 2.4 Delphi Study on New Technology in the Teaching of Secondary School Geography by the Year 2000: The Final Consensus Predictions

INTRODUCTION

The following predictions of the likely scenario for the role and effect of technology in the teaching of Geography in secondary schools by the year 2000 are based on a Delphi Study employing a panel of experts with a national reputation and credentials in computer assisted learning (CAL) in Geography. Each statement has been agreed by at least 21 of the 24 panellists.

Overall the panel are happy with the way they foresee things developing: unless otherwise indicated, their consensus view is that every expected change mentioned below is desirable or very desirable, though a few other highly desirable improvements such as additional technical support staff and expanded resource centres in schools were thought likely to occur only to a limited extent.

TEACHING METHODS

Computers will be regarded as a routine resource for all, similar to paper, pencil or book, and they will be used in virtually all areas of the curriculum. Teachers will be keen to use new technology, and through the National Council for Educational Technology, the Microelectronics Education Support Unit (MESU), initial and in-service training, they will be fully trained in its use.

The teacher-pupil relationship will change: teachers will not dominate - they will become facilitators. There will be greater pupil activity and mobility in the classroom, increased pupil-centred learning through computerised project work of all kinds, more experiential and enquiry-based learning and more group learning activities (e.g. focussed on computer-based decision-making or problem-solving exercises).

In fieldwork, there will be greater use of peripherals and data loggers to gather data, such as weather readings or noise levels. Portable and lap-top computers will be used actually in the field.

Although all these were seen as highly desirable changes, it was thought rather unfortunate that there might be a slight reduction in the breadth of geographical study resulting from increased in-depth project work using computers.

THE CURRICULUM

There will be more emphasis on skills and less on knowledge, and a general rise in academic standards as technology removes the boring mechanical tasks, such as graphics and statistics, leaving more time for investigation and analysis. Similarly, some topics will be taught to younger age groups because computers will handle the necessary complex mathematical calculations. Graphicacy will improve through the use of graphics packages, plotters, three dimensional projection, digital mapping, etc.

Greater use of computers to administer tests for prescribed assessment of the National Curriculum was also seen as likely, but was regarded as undesirable because of the extra burden such assessment imposes on teachers and the way computerized testing will affect the curriculum.

DATABASES, DATAFILES AND DATABANKS

Databases and datafiles will increase in importance, becoming as important as texts in a few classrooms, but not replacing them. A greater range of datafiles will be commercially available for the major interrogation systems such as GRASS, KEY and their successors. Pupils will make increased use of CD-ROMS storing vast amounts of data. A Geographical Information System will be in operation, and teachers will fairly routinely use huge on-line databanks and picture-banks, like PRESTEL, NERIS and The Times Network for Schools (TTNS), although pupils will not have much access to these. The expected changes mean that enhanced skills of data handling and analysis will be required by both teachers and pupils.

SIMULATIONS AND PROBLEM SOLVING

Computers will be used to a considerable extent for exploring alternative scenarios and "what ifs". Pupils will be more involved in complex computer-based simulations and role-plays, which will be more accurate and much more realistic than now, and in particular computers increasingly able to handle qualitative information will improve simulations involving values. There will be greater use of content-free problem-solving programs like RESOLVE, FORUM and PROBLEM SOLVER, but these will usually be used with specific geographical subject matter, and only in a few classrooms will decision-making and problem-solving skills be formally taught in a content-free context.

INTERACTIVE VIDEO AND SATELLITE IMAGERY

Both hardware and software for interactive video (I.V.) will become much cheaper and very much easier and faster to use. Ordnance Survey maps and atlases on I.V. will be in fairly general use and detailed discs will be available for many countries. It will be easier to obtain "hard copy" of I.V. images. All this will lead to increased use of I.V., particularly for data retrieval and imaginative simulations.

Similarly, reductions in cost, both for receiving and processing "live" satellite imagery, and even more so for producing "hard copies" of satellite images, means that both "live" and "non-live" remotely-sensed images will be in greater use and that new skills of interpreting them will be included in the Geography curriculum.

WORD PROCESSING, DESK-TOP PUBLISHING AND ELECTRONIC MAILING

Probably the most significant change by the year 2000 will be the greatly increased use of word processors by pupils, though word-processed work will not completely replace hand-written work except in a few classrooms. All pupils, both male and female, will be taught basic keyboarding skills, as speech-recognizing input devices are unlikely to be in use in schools by then. Wordprocessors will enable pupils' work to be put through a draft stage before being finally printed out for marking, and the general standard of presentation of pupils' work (text and graphics) will improve considerably, a "professional" design and layout being quite common. Pupils will also make more use of desk-top publishing, for example to simulate investigative journalism on world affairs.

However, electronic mailing, either by teachers to share ideas and teaching resources, or by pupils to communicate with other children in this country or overseas, is unlikely to be used much more than at present.

LINKS WITH INDUSTRIAL SOFTWARE

Escalating costs may reduce the amount of software produced specifically for the educational market, a possibility which worried panellists. Schools will use more generic software, such as spreadsheets, rather than "topic-specific" programs. Such content-free software, often designed for use in business or for industrial training, will create stronger links between education and the world of work. Anyway, educational software will become more like business software as the latter becomes more user-friendly and both adopt "Apple Mac"-type WIMP systems (which, in the case of educational software, will supersede touch screens and concept keyboards). Also, greater use will be made of educational software produced or sponsored by commercial / industrial organisations such as B.P. and British Gas, a development which received only a guarded welcome from the panel.

Appendix 2.5

REPORT ON SECOND MEETING OF CAL GEOGRAPHY RESEARCH GROUP

Room 802(b), May 18th, 1983 at the

UNIVERSITY OF LONDON INSTITUTE OF EDUCATION

1. Apologies were received from Sue Burkill and Simon Grummitt as well as from Jane Richardson a newly invited member.
2. Attendance consisted of Diana Freeman, Tony Ramsay, Bob Cummings, Lesley Yaffe, David Hassell, Deryn Watson, Patrick Wiegand, Andrea Tapsfield, Howard Midgley, Frank Burdett and Ashley Kent.
3. Frank Burdett introduced a paper on 'An organizational approach to public policy making : the example of LEA policies for microcomputers in schools'; Lesley Yaffe discussed the interim results of her national questionnaire survey towards her research on 'Microcomputers in geography and history teaching. Aspects of initial and in service courses'; Howard Midgley gave a review of GAPE's progress - the 1982-83 funding, the 1983-84 funding proposal and various issues of concern. Each speaker generated a great deal of interest and subsequent discussion through his/her enthusiasm and organisation.
4. Next meeting is to be at 5.00 p.m. at University of London Institute of Education, room 802(b) on October 7th 1983. The seminar will be led by:

Patrick Wiegand (University Department of Education Tutors Research)

Tony Ramsay (M.Phil. research)

Ashley Kent (Ph.D. research)
5. Meeting adjourned to bar at about 8.30 p.m.

W. A. Kent
16th September 1983

Report on Fourth Meeting of CAL Geography Research Group

Room 802b, June 15th 1984 at the University of London Institute of Education

1. Apologies were received from Sue Burkill and Andrea Tapsfield.
2. Attendance consisted of Jane Richardson, Diana Freeman, Tony Ramsay, Gregory Cracknell, Judith Binding, Frank Burdett, Bob Cummings, David Hassell, Chris Lawler, Deryn Watson, Ron Beard and Ashley Kent.
3. Jane Richardson now working for the Thames Water Authority explained and demonstrated the fieldwork programs she has developed with Bob Lewis with MEP funding. Bob Cummings showed us a videotape, a part of his M.A. dissertation research on pupil talk in CAL geography lessons and explained the nature of this work.

Gregory Cracknell, Judith Binding and Chris Lawler outlined their preliminary research ideas for M.A. dissertations.

Information was exchanged including the launch in 1985 of a new journal of CAL by Blackwell; a Diploma in Educational Computing, one year full time, to be run by the London Institute; the work of the ILEA geography CAL group; and the work just started by Diana Freeman with MEP funding.

4. Next meeting is to be at 5.00 p.m. at University of London Institute of Education, room 802(b) on Friday January 18th 1985.

The seminar will be led by:

Patrick Wiegand (University Department of Education Tutors' Research)

Paul Leonard (Recently completed M.A. dissertation research)

Diana Freeman (Progress of MEP funded research based at AUCBE)

5. Meeting adjourned to bar at about 7.00 p.m.

N.B. Additional members of group to be added to January 1984 list.

Ken Thomas]	
Chris Lawler]	
Judith Binding]	M.A. dissertation work at ULIE
Valerie Brett]	
Terry Goble)	M.Phil. dissertation at ULIE

REPORT ON THIRD MEETING OF CAL GEOGRAPHY RESEARCH GROUP

Room 802(b) 5.00 p.m., October 7th 1983

UNIVERSITY OF LONDON INSTITUTE OF EDUCATION

1. Apologies were received from David Hassell, Sue Birkill, Bob Cummings, David Hall and Patrick Wiegand. Simon Grummitt has withdrawn from the group owing to pressures of work.
2. Attendance consisted of Deryn Watson, Diana Freeman, Jane Richardson, Ron Beard, Richard Phillips, Paul Leonard, Mike Dove, Frank Burdett and Ashley Kent.

An amended membership list is attached.

3. Tony Ramsay gave an outline of his early thinking on his M.Phil. research; Deryn Watson kindly stepped in at the last minute to outline her Ph.D. research proposals; Ashley Kent outlined his own Ph.D. research progress. Brief reports were given by Richard Phillips, Jane Richardson, Paul Leonard, Mike Dove and Ron Beard.
4. Next meeting is to be at 5.00 p.m. at University of London Institute of Education, Room 802(b) on June 15th 1984.

The seminar will be led by:

Jane Richardson (MEP funded research)

Patrick Wiegand (University Department of Education Tutors Research)

Bob Cummings (M.A. dissertation research)

5. Meeting adjourned to bar at about 7.30 p.m.

W. A. Kent
January 1984

REPORT ON FIFTH MEETING OF CAL GEOGRAPHY RESEARCH GROUP

Room 802b, January 18th 1985 at the University of London Institute of Education

1. Apologies were received from Jane Richardson, Frank Burdett, David Hassell and Ron Beard.

2. Attendance consisted of Diana Freeman, Patrick Wiegand, Paul Leonard, Bob Cummings, Ken Thomas, Terry Goble, Andrea Tapsfield and Ashley Kent.

3. Diana Freeman spoke to a preliminary report on the Chiltern Region MEP Information Handling Project. Patrick Wiegand shared his experiences of class-room observation of CAL and outlined his concern that research work seemed to lack a theoretical base. Paul Leonard outlined his MA dissertation research work which involved the teaching and evaluation of the Rice Farming program.

Information which was exchanged included:- the status of NELCAL development; that the Journal of Computer Assisted Learning was encouraging contributions (write Bob Lewis, St. Martins College, Lancaster); that Ashley Kent has made an ESRC grant submission for a two day international research seminar on CAL; the recent article in Area (1984 16.4, 323-329) by Dawson and Unwin on 'The integration of microcomputers into British Geography'.

4. Next Meeting is to be at 5pm at University of London Institute of Education room 802(b) on Friday, October 18th, 1985.

The seminar will be led by:

Frank Burdett (Recently submitted PhD. thesis on public policy making - LEA policies for microcomputers in schools.)

Ken Thomas (MA dissertation research on the process and evaluation of software).

Chris Lawler (MA dissertation research on geography fieldwork and CAL)

5. Meeting adjourned to bar at about 7:30 p.m.

P.S. From convener Please let me know of any others who should be invited to our meetings (ie. actively or recently engaged in CAL research) and if any of the original groups are now unable to attend/be members.
Best wishes!

W. A. Kent
February 1985

REPORT ON SIXTH MEETING OF CAL GEOGRAPHY RESEARCH GROUP

Room 802b, October 18th 1985 at the

University of London Institute of Education

1. Apologies were received from Sue Burkill, Judith Binding and Chris Lawler. Since the latter two were to be married on October 19th it seemed a reasonable excuse!

2. Attendance consisted of David Riley, Deryn Watson, Ken Thomas, David Hassell, Andrew McCoshan, Tony Ramsay, Andrea Tapsfield, Paul Heinrich, Stuart Moye, Frank Burdett, Diana Freeman, Ron Beard and Ashley Kent.

3. Frank Burdett reported on the use of computers in higher education. In particular he summarized the papers presented at the IBG conference at Leeds in January 1985. The 13 papers presented are available from Phil Rees, the University of Leeds. Frank also illustrated some ways in which he uses data bases in his courses at Bath. Ken Thomas reported on the findings of his MA. dissertation (1985) in which he researched into geography software. Ken outlined his research design and outlined the views of teachers and pupils on 'successful' software.

Information which was exchanged included: Frank Burdett and Bob Cummings have submitted papers to JCAL; Ashley Kent has gained ESRC funding to run a two day international research seminar on CAL in the humanities/social sciences to be held at ULIE April 7th and 8th 1986; Terry Goble is now at the Chelmer Institute of Higher Education in the computing department; £6,000 has been granted to the Educational Computing Working Group of the G.A. by the DES to run 2 conferences and produce a teacher's booklet; the Oxford University Geography Department has gained substantial funding from UGC to develop software.

Finally Deryn Watson raised the issue of how we could make available to a wider audience the details of completed and ongoing research on CAL in geography. Approaching publishers was suggested as was using the network of University Department of Education tutors.

4. Next Meeting is to be at 5.00 p.m. at the University of London Institute of Education, Room 802b on Friday June 13th, 1986.

The seminar will be led by:

Chris Lawler (MA dissertation research on geography fieldwork and CAL)

Greg Cracknell (MA dissertation research on in-service training on CAL for geography teachers)

Stuart Moye (An interim report on his INSET work in Enfield as a part of the Diploma in Educational Computing at the Institute of Education)

5. Meeting adjourned to bar at 7.15 p.m.

P.S. from convener. Please let me know of others who should join our group by virtue of their engagement in CAL Research. *see page 2*

W. A. Kent
October 1985

REPORT ON SEVENTH MEETING OF CAL GEOGRAPHY RESEARCH GROUP

Room 802B, June 13th 1986 at the
University of London Institute of Education

1. Apologies were received from Greg Cracknell and a welcome was extended to Michael Milton and Stephen Rogers.

2. Attendance consisted of Stephen Rogers, Stuart Moye, Chris Lawler, Deryn Watson, Ron Beard, Tony Ramsay, Andrea Tapsfield, David Hassell, David Riley, Diana Freeman, Michael Milton, Ken Thomas and Ashley Kent.

3. Chris Lawler reported on his M.A. dissertation research work on geography fieldwork and CAL (recently submitted successfully for his M.A. Geography in Education). Stuart Moye gave an account of his action research in Enfield, a part of his work for the Diploma in Educational Computing in 1985-86.

Information which was exchanged included: details of ESRC funded CAL in the Social Sciences and Humanities International Seminar (Blackwell Scientific to publish the book edited by Ashley); Andrea explained about the DES funded project and the booklet which Peter Fox and herself had written; State of Play of 'Micros in Action in Geography Classrooms' to be published as a special supplement of Teaching Geography was outlined. It was hoped to be published by the October edition of TG; Mike Milton explained about the INSET pack proposals.

4. Next Meeting is to be at 5.00 p.m. at the University of London Institute of Education, Room 802B on Friday October 24th, 1986.

The seminar will be led by:

David Riley : Is there a case for modelling in geography using computers?

Greg Cracknell : A report on his dissertation on in-service training on CAL for geography teachers.

Julia Duckworth : An interim report on the Loughborough Interactive Video Project (Julia hopes to be able to make the meeting but she does have a commitment that day in northern England!)

W. A. Kent
October 1986

Report on Eighth Meeting of CAL Geography Research Group

Room 802A, October 24th 1986 at the
University of London Institute of Education

1. Apologies were received from Julia Duckworth, Patrick Wiegand, Paul Heinrich, Terry Goble and Tony Ramsay.
2. Attendance consisted of David Hassell, Deryn Watson, Cjes Krupski, Sirkka Ahonen, Bob Cummings, Steve Jefferys, Ken Thomas, Diana Freeman, David Riley, Phil Webster, Andrea Tapsfield and Michael Milton.
3. David Riley led an important seminar on 'Is there a case for modelling in school geography' and showed how his research interests were developing. This stimulated a considerable and interesting discussion. In the absence of Julia Duckworth who was busy editing video material in Sheffield, Ashley took the group through the state of play on the Loughborough Interactive Video Project via a transparency sent by Julia.

Information which was exchanged included: the progress Mike Milton and Phil Webster had made on their Geographical Education with Micros: An In-service Resource Pack; the publication of The Use of Computers in the Teaching of Geography, IGU 1986 edited by Ashley Kent; and the IGU Commission on Geographical Education proposed video project for summer 1988. (copy enclosed).

4. Next meeting is to be at 5.00 p.m. at the University of London Institute of Education, Room 802B on Friday May 15th 1986

The seminar will be led by:

Paul Heinrich to report on his M.Phil. research on CAL in the 11-16 school.

Steve Jefferys (Teaching Style and CAL) and Stephen Rogers (CAL Geography INSET in Essex) to report on M.A. dissertation research progress.

Mike Milton and Phil Webster to report on progress with the INSET pack.

W. A. Kent
November 1986

Report on Ninth Meeting of CAL Geography Research Group

Room 802b, May 15th 1987 at the

University of London Institute of Education

1. Apologies were received from Paul Heinrich.
2. Attendance consisted of Terry Goble, Steve Jefferys, Michael Bradford, Bob Cummings, Diana Freeman, David Hassell, Andrea Tapsfield, Michael Milton, David Riley, Stephen Rogers and Ashley Kent.
3. Steve Jefferys reported on the progress of his research on learning in the CAL classroom and used a classroom video to illustrate this.

Stephen Rogers reported on his questionnaire survey of Essex geography departments, his plans for interviews and his focus on constraining and enabling influences on take up.

Michael Milton reported on the progress of the CBL INSET pack.

Information which was exchanged included: publication of Deryn's new book; progress on the IGU video project due for completion by the end of 1987; David Hassell's project at AUCBE; latest MESU 'news' from Andrea; Stephen Rogers new post as adviser in Clwyd.

4. Next meeting is to be at 5.00 p.m. at the University of London Institute of Education, Room 802b on Friday October 16th, 1987.

The seminar will be led by:

Mike Dove to report on his completed M.A. research into CAL in Victoria, Australia.

Paul Heinrich to report on his completed M.Phil. research on CAL in the 11-16 school.

Terry Goble to report on his ongoing M.Phil. research on expert systems/Prolog and geography.

Alan Jones to report on his completed M.Ed. research in Hertfordshire.

W. A. Kent
June 1987

Report on Eleventh Meeting of CAL Geography Research Group

Room 802B, October 14th 1988 at

the University of London Institute of Education

1. Apologies were received from Andrew Phillips and Andrea Tapsfield.
2. A welcome was extended to Mrs. Peijing of the geography department, Teachers College Beijing and Roger Clark of the Sussex Institute of Higher Education.
3. Attendance consisted of Roderick Allen, David Hassell, Ken Thomas, Bob Cummings, David Walker, Mrs. Peijing, Paul Heinrich, Roger Clark, Frank Burdett, Terry Goble, Tony Ramsay and Ashley Kent. Andrew Phillips was able to join us later in the bar!
4. Roderick Allen reported on his Phd research into CAL and geography at the University of Cambridge.
Ashley Kent, in Andrew Phillips, absence reported on the progress and prospects for Project HIT based at the London Institute of Education.

Information which was exchanged included:

- o Learning Geography with Computers Pack and network of regional coordinators.
 - o Domesday in Schools Project and publication plans.
 - o IGU and MESU classroom videos.
 - o AUCBE activities.
 - o Frank Burdett's recent appointment to Acorn computers.
 - o Paul Heinrich, a Hampshire ESG reported on his county's activities.
 - o David Walker reported on recent developments in higher education not least in geographical information systems.
 - o Ashley Kent reported on the establishment of the Geography Curriculum Development Unit (GCDU) based at the Institute and directed by Vincent Bunce.
 - o Tony Ramsay's work on software development.
5. Next meeting is to be at 5 pm at the University of London Institute of Education, Room 802B on Friday, May 5th 1989.

The seminar will be led by:

Andy English to report on his completed MA research into the use of Prestel in geography education.

Roger Kerr to report on his completed MA research into weather satellite imagery in schools.

Andy Phillips to give a progress report on Project HIT which by then will be nearing the end of the first year of work.

6. Membership of the Research Group

If you still wish to be a part of this research group and receive brief reports, agendas and attend seminars could you please complete the attached slip?

W.A. Kent
November 1988

To: Ashley Kent
Department of Economics, Geography and Business Education
University of London
Institute of Education
20 Bedford Way
London WC1H 0AL

I do wish to remain a member of the CAL Geography Research Group.

Name: _____

Home Address: _____

Telephone No: _____

Work Address: _____

Telephone No: _____

Report on Twelfth Meeting of CAL Geography Research Group

Room 803, May 5th 1989 at

the Institute of Education University of London

1. A welcome was extended to Prof. H. Schrettenbrunner (Nurnberg) Maria Bezanilla (Bilbao) Harvey Mellor (Maths, Statistics and Computing Department at the Institute) and Bob Anderson (Ellen Wilkinson High School).
2. People who attended were: Andrea Tapsfield, Terry Goble, David Hassell, Harvey Mellor, Helmut Schrettenbrunner, Andy English, Maria Bezanilla, Diana Freeman, Bob Anderson, Andy Phillips and Ashley Kent.
3. Andy Phillips gave a progress report on Project HIT.

Andy English reported on his research into Prestel and geography education.

Roger Kerr reported on his research into weather satellite imagery in Schools.

Information which was exchanged included:

- o Roderick Allen is now working at Guildford Grammar School, Guildford W. Australia.
 - o 1989 Publication of Domesday in Schools Project was annouced.
 - o NCET/MESU update from Andrea
 - o Helmut described his work at the University of Nurnberg/Erlangen.
4. Next meeting is to be at 5 pm at the Institute of Education University of London, Room 803 on Friday October 6th 1989.

The seminar will be led by:

Maria Bezanilla to report on her Phd research on data handling.

David Hassell to report on the recently established 'Modelling Across the Curriculum Project' funded by the Training Agency.

Deryn Watson to give an interim report on the large scale evaluation project with which she is involved at King's College.

I look forward to meeting you again on October 6th.

Ashley Kent
June 1989

Director: Professor Denis Lawton, BA, PhD

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Department of Economics, Geography
and Business Education
Geography Education Section

REPORT ON THIRTEENTH MEETING OF CAL GEOGRAPHY RESEARCH GROUP

ROOM 803, FRIDAY OCTOBER 6th 1989

AT THE INSTITUTE OF EDUCATION UNIVERSITY OF LONDON

1. People who attended were: Andy Phillips, Harvey Mellor, Tony Ramsay, Maria Bezanilla, Andrea Tapsfield, Deryn Watson and Ashley Kent
2. Maria Bezanilla reported on her Phd research work on the processes of data handling. The pilot study has been based at St. Francis Xavier Sixth Form College and geography students were involved.

Deryn Watson reported on the large scale evaluation project with which she is involved. It is DES funded and entitled, 'Evaluation of the Impact of IT on Childrens' Achievements'

3. Next meeting is to be held on **Friday 11th May 1990 at 5 pm**

The seminar will be led by:

David Hassell to report on the 'Modelling Across the Curriculum Project' funded by the Training Agency.

Andy Phillips to report on Project HIT towards the end of its two year life.

I look forward to meeting you again on **11th May 1990**.

Ashley Kent
October 1989

Appendix 2.6

The Development of Computer Assisted Learning in Geography (1980 - 1983)

Hall D, Kent W.A and Wiegand P

This report is a description of a questionnaire survey designed to monitor the development of CAL in geography in three regions of England between 1981 and 1983. The information contained herein may be regarded as a 'time-capsule': an exercise in the contemporary history of geography education. It was our intention to use the survey as a database from which other research initiatives would spring (see for example Wiegand, 1984 a, b) as well as documenting what seemed to us (in 1980) to be the forthcoming 'take off' period of computer usage in geography teaching.

Three regions (Yorkshire, Greater London and the South West) were chosen to be representative of a range of social characteristics and types of educational provision.

West and North Yorkshire represents a balance between the West Yorkshire conurbation, dominated by Leeds and Bradford and predominantly rural areas such as the Yorkshire Dales. The Local Authorities of Bradford, Leeds, Calderdale (Halifax), Kirlees (Huddersfield), Wakefield and North Yorkshire show differences in their educational provision. Although some areas of selective schooling remain (for example in Halifax, Heckmondwike and the York area) the majority of maintained secondary schools are comprehensive. Leeds and Bradford are 3-tier authorities with middle schools for the 8-12 and 9-13 age ranges. The other LEA's have predominantly 11-16 and 11-18 comprehensive schools.

West and North West London consist of inner and outer suburban areas of the capital. On the one hand south Brent is a socially deprived area, typically inner city in characteristics except for location and on the other hand north Barnet is on the edge of the Green Belt and amongst the richest parts of the Greater London Council (GLC) area. The predominant provision for the boroughs of Barnet, Brent, Ealing, Harrow, Hillingdon and Hounslow is the 11-18 mixed comprehensive school but there are both inter and intra borough variations. For instance Harrow has an 11-16, 16-18 (Sixth Form and Further Education College) system whereas Ealing has a '3-tier' system not unlike Leeds and

Bradford. Naturally there is a scatter of voluntary aided, single sex, church founded and maintained, and independent (usually single sex) schools.

The South West covered the four counties of Avon, Gloucestershire, Somerset and Wiltshire with a population of some 21/2 million. Apart from Bristol, the area is predominantly one of smaller cities and market towns, with perhaps Gloucester and Swindon claiming significant manufacturing status. Whilst Avon is predominantly 11-18 comprehensive, Gloucestershire has retained eleven Grammar Schools and sixteen secondary modern together with twenty-five comprehensive schools. Somerset is particularly heterogeneous, with one sixth form college, two tertiary colleges, (included in the survey) and nine middle schools (not included in the survey) as well as 11-18, 11-16 and 14-18 schools. In Wiltshire, only five secondary modern schools now remain within the Authority (in the Salisbury region), although at the time of the survey the Swindon area was being reorganised into the comprehensive pattern. Outside Somerset, therefore, the predominant pattern is of 11-18 schools.

Questionnaires were sent out to heads of geography departments in the spring of 1981, 1982 and 1983, a period of high growth potential for CAL in schools because of two strands of government policy. The Department of Industry began its "Pound for Pound" scheme for secondary schools in 1981 and the Microelectronics Education Programme (MEP) was initially funded between 1981 and 1984.

In 1981, the first year of the survey, there were so few geography departments engaged in CAL that it was decided to identify them by local course attendance registers, LEA advisers and word of mouth. Other sources used were lists of enquirers to GAPE and early purchasers of the Computers in the Curriculum Project suite of programs. (1979). This 1981 survey of the very limited number of CAL geography activists in the 16 LEAs within the 3 regions was reported in the January 1982 issue of Teaching Geography (Hall et al 1982). In the case of the London region, with its 6 LEAs, only 12 schools had geography departments with any involvement in CAL. Indeed 1 LEA had none in this category.

The 1982 and 1983 surveys were conducted by postal questionnaire to all LEA schools. Although response rates (see table 1) are at first sight disappointing it is more than probable that the responses include very nearly all the teachers/schools at all active in CAL. The non respondents are in the writers'

opinion most likely to represent the (as yet) inactive majority. This survey then gives a picture of nearly 300 schools across the country.

Apart from school details, the questions were grouped under the following four headings:

1. School Computing Facilities
2. Computing in the Geography Curriculum
3. In-Service Training
4. Views on CAL and geography

1. School Computing Facilities

Table 2 shows a dramatic increase in the number of micros in the schools in the twelve month period from Spring 1982 to Spring 1983. In this period the numbers of BBC micros expanded rapidly and the 380Zs and BBC machines become dominant with the latter a clear front runner. Apples and PETs lost ground relative to their competitors. Less known micros such as the Dragon, ITT, Torch, VIC 20, TRS 80, and Tandy were scattered around the schools and of these the Sinclair Spectrum occurred most often but in such small number that it is not worth detailing in the table.

Increasingly schools have concentrated on the 380Z and BBC (almost entirely now the 'B' model) with the latter threatening to achieve a monopoly in the next few years. The Department of Industry 'pound for pound' scheme is one of the key reasons for the dominance of these two micros with the price and capabilities of the BBC causing it to become more popular than the 380Z. Many decisions about the purchase of types of micros have been taken by an LEA on behalf of its schools, and this probably explains the existence of both BBCs and 380Zs in Avon schools, the predominance of BBCs in Harrow schools and 380Zs in Barnet schools. The doubling of the average in the numbers of micros per school within a year conceals wide variations in provision in particular schools ranging from one to over ten.

Department of Industry support has helped increase the number of micros with printers and high resolution graphics as Table 3 suggests. However, something like one third to one half of all micros did not have such peripherals. This limits

their use for a whole range of modern programs. In particular even in 1983 about 30% of micros in our sample did not have high resolution graphics and 50% did not have a printer. Similarly lack of colour monitors and the limited memory of some micros prohibited colleagues from using certain programs.

There seems to be two principal internal arrangements for making micros available within schools. In some schools there is a specialist computer room, often with many micros, which can be booked by a geography teacher. In other schools a trolley is used to wheel the micro around the school to wherever it is needed. The former marginally predominates but there are signs that more trolleys are being provided. Whichever arrangement exists, the geography teacher still has problems getting to a micro in competition with the heavy demands of a computer studies department running computer literacy courses as well as CSE and GCE courses in computer studies.

2. Computing in the Geography Curriculum

The majority of responding schools taught no CAL geography lessons in 1982 and 1983, but (as shown in Table 4) by 1983 far fewer 'blanks' were recorded. Bearing in mind the probability that the majority of non respondents were non CAL users, the position is that only a minority of geography teachers use micros at all. Of the users there is some evidence that most teachers either teach between one and five lessons a year (commonly only one or two) or eleven or more (representing a small but keen majority).

Over the three year period since 1981, there has been a rapid demise of the early GAPE programs, and a very rapid uptake of the more recent and expensive Heinemann programs. CLIMATE and WEATHER. Interestingly enough the suite of programs produced by the Computers in the Curriculum Project (first published 1979) are still dominant, but this is hardly surprising since their favourable price encourages geography teachers to buy them as their first venture into CAL. Some programs are especially popular in certain areas for instance G STARTS in Avon and WEATHER in Wiltshire. DEMOG, G START and MORPH are used mainly at 'A' level; CLIMATE and WEATHER at 16+ and 'A' level; MILL for 11-16 age classes with some 'A' level; and FARM across the whole age range. In particular DEMOG, FARM, and MILL seem to be used most often by schools. Some mention was made of other programs especially HURKLE, QUERY, GRIDREF, HIKE and TRAFFIC.

3. In-Service Training

The pattern of courses in computing, whether related to geography or not, varies across LEAs according to initiatives taken by individuals and/or institutions. For instance in Avon in 1983, 45 responding teachers attended such courses in contrast to only 10 in Somerset. (see Table 6).

The largest number of courses seem to be those mounted by LEAs, often at teachers' centres. Experienced geography teachers are often active in participating in or leading such courses, some having secondment from the authority to fulfil this role. Some local colleges have established a reputation for an active role in CAL INSET, for example Trinity and All Saints College near Leeds, and the College of Ripon and York St John. Attendance at school based and national CAL courses were not often reported by geography teachers responding to the questionnaire.

Table 7 suggests that teachers with 6-10 years experience are most interested and active in CAL geography. However since many heads of departments are in this category and filled in the questionnaire, either they were in a better position to take advantage of such courses or they might be unaware of the attendance of members of their department on such courses.

The impact of MEP initiatives via Regional Centres seems limited except in Yorkshire where a regular programme of courses for geography has been initiated. There is some evidence that numbers attending courses in CAL are holding steady or on the decline but that there is a move away from one or half day courses towards short courses over several days or evenings.

Over the three year period there was a continuing demand for INSET courses, though many teachers seemed unaware of those on offer. The overall impression was of keenness and intention to 'have a go' in the near future in spite of concerns about cost of programs and access to the micros in the school.

4. Views on CAL and Geography

Many respondents took the trouble at the end of the questionnaire to outline their views. Many expressed interest and every intention of beginning CAL in the near future. 'We would like to start CAL next term' and 'If I stir myself we can make more use of CAL in geography in the future'. Others were concerned

about the constraints and limitations of this innovation. '.... but not enough time to bring it into the curriculum properly' and 'so far I've found material for geography very limiting at present'.

The views of respondents were sought via their responses to a series of statements, positive and negative, concerning CAL geography. Clearly much faith is placed in the potential of CAL to simplify the real world in computer games and simulations (statement 1 in Table 8), motivate pupils (statement n) and enable children to handle a range of variables while solving problems (statement o). Many teachers feel that in spite of financial cutbacks (statement n) CAL geography has wide educational value (statement h) and can help develop 'computerate' pupils (statement e). Neither do they think that computers in geography have the prime advantage of information retrieval (statement g) nor that too much teacher time is involved in learning about CAL for geography teaching (statement i). A good deal of unanimity was revealed by agreement on all the above and suggests a teaching force ready and willing to explore the new medium since the various potentials on CAL seem understood and appreciated.

However a bipolar spread of opinion is revealed to statements a, b, f, j and k which split the main bulk of responses into 'Agree' or 'Disagree' categories. Perhaps this suggests that there are some converts who are informed about CAL whereas there are others who have yet to be convinced or informed. The most mixed opinions were expressed about statements c and d concerning the quality and suitability of geography programs. This could well point to the present difficulty of geography programs being seen and tried out by teachers and/or the genuine (as yet) mismatch between published programs and their objectives and the objectives of syllabuses taught.

Several respondents did not fill in this section of the questionnaire and the following three quotations represent their views 'As yet I have no practical experience on which to base my views', 'We are unable to answer those left blank due to lack of experience in this field' and 'As I don't know anything about this I can't answer. Ask me again when I've been on the course and know what is involved'.

CONCLUDING COMMENTS

Many software programs listed by publishers have been reissued for use with the BBC Model 'B' machine in the knowledge that this has established itself as

the market leader in the schools. Its disadvantage of limited memory has been met by the availability of a second processor (either another 6502 or the Acorn Z-80 with CP/M) thus equalling the capacity of the RM 380Z in this regard. But those who purchased the Dragon or Lynx machines have seen these producers go into receivership with little prospect of adequate software support. Even the BBC machine will face increased competition from newer challengers: Advance, Amstrad, Enterprise, Memotech and Tatung.

Without doubt, too, geography teachers have, in the year 1983-84 become much more at home with operating procedures and the computer jargon that goes with it. At Bristol, for example, a national three-day course of inexperienced teachers held in Spring 1984 was much more effective than that held in the previous year: this was not just a matter of a wider range of software and more effective hardware management, but also greater computer awareness if not classroom experience of the greater number of membership.

It may also be that the less expensive home-based computer will take over from the more sophisticated models used in schools as the main source of CAL innovation in Geography, thus moving the emphasis away from large-scale number crunching programs to simpler ideas designed to improve basis skills in the subject. Hopefully, too, more flexible programs which adopt an interactive role for the student will become available, using languages other than Basic (such as Logo) to move us from the neotechnic period of computer assisted learning (Hall, 1984). Meanwhile, set against the remorselessness of technological change, is the fact of limited finance and continued pressure on teaching time in a contemporary scene increasing demands on expectations of the profession by pupils, parents and employers.

We have described what seemed to us to be happening in computer assisted learning in geography between 1980 and 1983. Other aspects of this development have been reported elsewhere (Hall et al 1982 and in press). This early period of the use of computers in geography teaching was characterised by a growth aspect in the provision of both hardware and software. A considerable variety of hardware was in use early in the period of study but a few micros were eventually to dominate and these come to determine the format of software for the educational market. Although the number of programs available for teaching geography increased rapidly during this period there seemed to be a considerable time lag before programs were actually used in schools and the very earliest software that was available has remained persistently popular. Also noticeable at this time has been the

widening gap between those colleagues whose experience of CAL has widened and whose expertise has grown and those who have not yet experimented.

It seemed to us in 1980 that the period 1980-83 would represent the take off point of CAL in geography. A year later it is still difficult to say whether we guessed correctly. On the one hand new and exciting software has been published whereas on the other hand much computing is still superficial with little evidence either of progression or systematic integration into the geography curriculum. Watch this space in 1994 for a longer look back!

Notes:

1. GAPE now stands for Geographical Association Programme Evaluation.

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1982**1983**

	No of responding schools	% response rate	No of responding schools	% of response rate
Yorkshire	131	65%	79	40%
London	64	58%	54	49%
South West	79	41%	133	68%
	TOTAL	MEAN	TOTAL	MEAN
	274	55%	266	52%

Table 1: Schools which responded to the survey

	380Z	BBC	ZX81	Apple	Pet	Others	Average Micros per school
London '82	59	33	39	10	7	37	2.89
London '83	84	100	21	8	8	36	4.75
South West '82	72	26	32	5	21	15	2.16
S. West '83	168	236	62	13	33	11	4.53
W & N Yorkshire '82	110	20	38	17	67	29	2.14
W & N Yorkshire '83	87*	138	40	7	34*	38	4.35
Total Nos '82	241	79	109	32	95	81	2.39
Regions '83	339	474	123	28	75	165	4.54

* This apparent decrease is probably due to a change in the sample population.

Table 2: Numbers and Types of Micros in the Three Regions.

	Printers	High Resolution Graphics (HRG)
London 1982	84	56
London 1983	58	53
South West 1982	58	53
South West 1983	123	415
W & N Yorkshire 1982	145	110
W & N Yorkshire 1983	209	194

Table 3. Numbers of micros with printers and HRG

	London		West and North Yorkshire		South West	
No of lessons taught	1982	1983	1982	1983	1982	1983
0	53	30	93	47	69	80
1-5	6	10	16	12	7	16
6-10	0	3	8	8	3	13
11+	3	10	19	13	5	17

Table 4 Geography lessons using a microcomputer

	London		W & N Yorkshire		South West		Total	
(1983 figures) Programs	Lessons taught	No of centres	Lessons taught	No of centres	Lessons taught	No of centres	Lessons taught	No of centres
Demog	76	12	90	19	49	13	215	44
Farm	36	6	39	9	30	7	105	22
Mill	30	5	43	7	26	7	99	19
Weather	18	5	4	4	62	19	84	28
Climate	19	5	7	7	31	12	57	24
Morph	21	6	17	10	17	7	55	23
G. Stats	8	4	7	7	27	8	42	19

Table 5: Use of published programs by lessons and by centres in 1983

Types and location of the course	London	W and N Yorkshire	South West
LEA/Teachers Centre	25	29	42
College	14	31	7
Polytechnic	14	2	18
University	2	9	18
School	4	4	9
National	1	1	

Table 6. No of attendances at InService CAL Course sponsored by the major providers.

Years of teaching	London	W & N Yorkshire	South West
0-5	17	17	16
6-10	22	34	37
11-15	11	21	19
16-20	4	4	23
21+	7	10	14

Table 7: Length of teaching service of attenders at CAL courses 1983.

- a. There are too many problems involved in using computers in geography teaching
- b. Until more micros are available to teachers, there is little point in using CAL in geography classrooms
- c. Geography programs are of low quality
- d. Geography programs do not suit present geography courses
- e. Geography teachers along with other teachers should held to develop 'computerate' pupils
- f. The main value of microcomputers is to perform statistical analysis of geography data
- g. The main value of microcomputers is for the storage of geographical information for retrieval
- h. There is limited educational value in using CAL for geography teaching
- i. There is too much teacher-time involved in learning about CAL for geography teaching
- j. CAL should transform the geography classroom of the 1980s
- k. There is little help or information available about using the computer in geography teaching
- l. CAL can help children's learning by simplifying the real world in computer games and simulations
- m. CAL can help to motivate pupils in geography lessons
- n. In the present world of 'cuts' CAL and geography should take a very low priority
- o. CAL can help children handle a range of variable in a problem solving situation

13	99	61	125	12
40	105	32	104	28
20	46	123	89	7
18	81	90	99	7
77	177	33	28	5
20	110	51	109	19
16	79	59	139	28
8	65	38	138	56
16	65	81	135	18
20	83	72	121	15
38	125	47	85	9
44	189	47	29	5
56	195	35	14	4
12	51	57	152	53
62	198	40	8	5

SA = Strongly agree
A = Agree
I = Indifferent
D = Disagree
SD = Strongly disagree

Table 8 Attitudes to CAL by geographers



Director: William Taylor, BScEcon, PhD, DSc, Litt.D, FCCEA, FCP

Deputy Director: Professor Denis Lawton, BA, PhD

Department of Geography

Head of Department: Professor Norman Graves BSc Econ, MA, PhD

3/6/82

To: Chief Education Officer

For the attention of the Geography/Humanities Adviser

Dear Sir,

I am currently engaged in M.Phil. research concerning computer assisted learning and the geography teacher. As you know with the advent of the micro computer in many of our secondary schools; the increased availability of computer software; and the involvement of the government through the Micro Electronics Education Program, the nineteen eighties could see an increased use by teachers and students of computer assisted learning across the curriculum.

My research interest is to explore the evolving response of geography teachers to the micro computer as well as to analyse the vital interaction between teachers, Local Education Authority Advisers and the various central agencies. It is hoped that insights will be gained into the management of future curriculum developments and specifically to determine how effective a government sponsored curriculum development has been in practice.

As a first step, it is important to survey the position with regard to C.A.L. and geography teaching nationally, and I very much hope that geography/humanities advisers will help me in this by completing and returning a short questionnaire. I enclose a copy of the questionnaire and I hope that you will wish to encourage your adviser to complete it.

I enclose a supporting letter from my supervisor and hope you too might see fit to support this exercise.

Yours faithfully,

W.A. Kent

W. A. Kent

Questionnaire to L.E.A. Advisers with responsibility for Geography/
Humanities.

PART 1 ABOUT YOURSELF AND YOUR L.E.A.

. Full Name:

Position:

Work Address:
.....
.....

Telephone No.

- . Numbers of 11-18 Educational Establishments in your L.E.A.
Please enter the number in the appropriate box.

Type of Educational Establishment	Mixed	Boys	Girls
1. Grammar School	<input type="text"/>	<input type="text"/>	<input type="text"/>
2. Comprehensive School (11-18)	<input type="text"/>	<input type="text"/>	<input type="text"/>
3. Senior High School (13 or 14-18)	<input type="text"/>	<input type="text"/>	<input type="text"/>
4. Further Education College	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. Sixth Form College	<input type="text"/>	<input type="text"/>	<input type="text"/>
6. Tertiary College	<input type="text"/>	<input type="text"/>	<input type="text"/>
7. Independent Schools	<input type="text"/>	<input type="text"/>	<input type="text"/>
8. Other - please specify			
.....	<input type="text"/>	<input type="text"/>	<input type="text"/>
.....	<input type="text"/>	<input type="text"/>	<input type="text"/>

ART 2 COMPUTING AND YOUR L.E.A.

Is there an adviser with direct responsibility for computers, computer studies and computer assisted learning (C.A.L.)?

YES ☐ NO ☐

If YES, please describe the post(s) such an adviser(s) holds.

.....
.....
.....
.....

What is your M.E.P. (Micro Electronics Education Program) regional information centre?

.....
.....

What uses do your L.E.A. and your teachers make of the services offered by this regional centre?

Please tick the appropriate box.

Half and One Day Courses	<input type="checkbox"/>
Two to Seven Day Courses	<input type="checkbox"/>
Courses up to One Term	<input type="checkbox"/>
Courses of at least One Term	<input type="checkbox"/>
Newsheet	<input type="checkbox"/>
Programming Advice	<input type="checkbox"/>
Hardware Advice	<input type="checkbox"/>
Advice on Software Available	<input type="checkbox"/>
Other Services, please specify	
.....	<input type="checkbox"/>
.....	<input type="checkbox"/>
.....	<input type="checkbox"/>

Has your L.E.A. made use of the Department of Industry's grant scheme towards the purchase of micro computers for Secondary Schools?

YES ☐ NO ☐

If YES, how many micro computers have been bought under this scheme?

	R.M.L. 380Z	B.B.C. Acorn
School Year 1981/82	<input type="checkbox"/>	<input type="checkbox"/>
School Year 1982/3	<input type="checkbox"/>	<input type="checkbox"/>

How many micro computers were in these educational establishments in June, 1983 and are planned to be there by June 1984?

Grammar School
 Comprehensive Sch.
 (11-18)
 Senior High School
 13 or 14-18)
 Further Educ. Coll.
 Technical Form College
 Vocational College
 Independent School
 Other, please specify

[illegible]

9). Do the 11-18 educational establishments in your L.E.A. ~~with~~ a micro computer in general have:

- | | | | | |
|---------------------------------|-----|--------------------------|----|--------------------------|
| a) Printers? | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
| b) Disc drives? | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
| c) Cassette drives? | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
| d) High resolution graphics? | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
| e) Colour visual display units? | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
| f) Graphics tablet? | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |

1. General observations on micro computers available in your L.E.A.
(e.g. when bought, where stored, buying policy, networks etc.)

[illegible]

2. How many mainframe computers exist in your L.E.A. which can be made use of by 11-18 educational establishments?

11

8. For what purposes are micro computers used by geography teachers in your L.E.A.?

Purpose	No. of 11-18 educ. establishments
For information retrieval	<input type="text"/>
Statistical Analysis	<input type="text"/>
Simulation	<input type="text"/>
Geographical Games	<input type="text"/>
Other uses, please specify	<input type="text"/>
.....	<input type="text"/>
.....	<input type="text"/>
.....	<input type="text"/>

Have courses of the following types been available to your geography teachers?

19.a) General computing courses? YES ☐ NO ☐

b) Please give details of courses already run, giving number of teachers who attended; who organised the course; nature and length of course; when held.

.....

20. a) C.A.L. and geography courses? YES ☐ NO ☐

b) Please give details of courses already run, giving number of geography teachers who attended; who organised the course; nature and length of course; when held.

.....

21. a) In 1983 does your L.E.A. intend to provide (or support) any computer courses suitable for geography teachers?

YES ☐ NO ☐

1. b) Please give details of number of teachers expected to attend;
who is organising the course; nature and length of course; date(s)
to be held.

.....

ART 4 YOUR VIEWS ON C.A.L. AND GEOGRAPHY.

2. Please tick the column which best describes your attitude to
C.A.L. and geography teaching.

Column 1 = Strongly Agree
 Column 2 = Agree
 Column 3 = Indifferent
 Column 4 = Disagree
 Column 5 = Strongly Disagree

Statement	1	2	3	4	5
. There are too many problems involved in using computers in geography teaching.					
. Geography teachers along with other teachers should help to develop 'computerate' pupils.					
. Until more micros are available to teachers, there is little point in using C.A.L. in geography classrooms.					
. The main value of micro computers is to perform statistical analysis of geographical data.					
. Geography programs are of low quality.					
. The main value of micro computers is for the storage of geographical information for retrieval.					
. Geography programs do not suit present geography courses.					
. C.A.L. should transform the geography classroom of the 1980's.					
. There is limited educational value in using C.A.L. for geography teaching.					
. C.A.L. can help children's learning by simplifying the real world in computer games and simulations.					
. There is too much teacher-time involved in learning about C.A.L. for geography teaching.					

contd.

- | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

If you have any further points you would like to make about C.A.L., or the design of the questionnaire please elaborate below:-

[illegible]

Appendix 5.1

Example of transcribed interview

Sara Norris
School 1F

20/12/83

At Sara Norris's Home

Background

Eustace Cobb is Head of Geography

11 - 18 mixed comprehensive

Six geographers - 4 F/T, 2 part of a geography timetable

The part timers are: a PE teacher
 head of sixth form

Geography courses offered: 'O' level; CSE; 'A' level

Lower Sixth - 17 Upper Sixth - 18. Taught in two groups because geography in two option columns a) arts/humanities, b) science.

First, second, third years (years 7,8,9) have 2 x 40 minutes geography lessons a week.

Fifth form (year 11) 4 x 40 minute lessons a week.

Interview

Q. What type of courses in first three years?

A. They are somewhat old fashioned. They are based on the Young and Lowry books.

First year	British Isles
Second year	European Studies
Third year	Physical Geography and Map Work

Q. Is there streaming by ability in the school?

A. Banded (A,B,C) according to Borough's system. Two top bands and one remedial form and rest are very much similar ability bands. Then they are sorted out at the end of the first year.

Q. What is the reason for the first three year's courses? How have they come about?

A. I think it is something the head of geography established a long time ago and has stuck with having bought text books.

Q. What books are you talking about?

A. Young and Lowry books 1 and 2 seen as a world geography series, but it is very out of date now. I think most of the staff use them very little. The head likes pupils to have textbooks and most people use other material because they are so dated.

Q. To what extent do geographers ever meet and discuss courses?

A. Never.

Q. To what extent do they meet about anything?

A. Uhm, we never have departmental meetings. We are given the syllabus by the head of department and we tend to go very much our own way and follow our own interest.

Q. Is it a hierarchical arrangement whereby the HOD decides everything?

A. No, not really, because we all, I am afraid, go our own way under the system.

Q. Are there assessments at the end of each year?

A. Yes, we have half yearly assessments and the one in the spring is within the set so we set our own exams for our own set and they are graded ABCD within the set but in the summer we have an exam which is set and covers the whole year, theoretically. We don't give a common exam until third form level.

Q. It sounds very fragmented in all sorts of ways.

- A. Oh yes - it is not a cohesive department at all.
- Q. What about the fourth and fifth year courses you are doing?
- A. Very few are not entered for a public exam so we do 'O' level and CSE. We do South East CSE and AEB 'O' level. We stuck with AEB because it is so close to the CSE syllabus ... Most people do the 'O' level mock.
- Q. What sort of numbers are we talking about?
- A. I should think as many as 60 doing 'O' level and about 100 CSE and very few not being entered for anything at all.
- Q. What about post-16 courses?
- A. Only the 'A' level course and the retake 'O' levels in the lower sixth. It is the 'A' level London course.
- Q. How does that follow on from the 'O' level?
- A. It doesn't really. We start afresh.
- Q. To what extent are there links between individual members of the department, sharing of resources?
- A. Oh yes, yes, ehm, between some individuals more then others. Uhm, so that most of us who use photocopying or binders tend to share.
- Q. Can you point a pen portrait of the six people in the department?
- A. The HOD has been in the school for close on 40 years since just after the war from primary, secondary modern to comprehensive school. It was his first teaching post.
- Q. That reflects a fairly conservative stance?
- A. That's right, yes.
- Q. He must be the oldest member of staff?
- A. No, there are three altogether who followed a similar pattern.
- Q. Is he therefore a powerful man in the school?
- A. No, no.
- Q. Why is that?
- A. Because he took a degree in the evenings later, because he is a very mild mannered gentle person and he is not ambitious, or driving in any way. He is not politically minded at all.
- Q. Where does the department stand in comparison to other departments in the school? Numbers and influence on the head perhaps?

- A. Because he is not a politically minded person and is mildly mannered - low, because he won't fight for status.
- Q. But in fact your numbers are really quite healthy.
- A. Oh yes, yes, I think that is because of the overall enthusiasm and standard of teaching within the department.
- Q. In spite of the lack of leadership?
- A. Yes.
- Q. What about the other people in the department?
- A. The Head of Sixth Form has a good Oxford degree and an MA and has done work in colleges of education and has been head of geography in a big comprehensive school in Sussex and was head of lower school before he became head of Sixth Form. He is enthusiastic but his teaching of geography has become less with his increased administrative work. He is the only person apart from me interested in computing. He is the only one who came with me to the local GA, he is keen on fieldwork. He is quite a driving force with the sixth form level of geography because of his interest ... he is less up to date than he was because his interest are going towards sixth form work. He is a good enthusiastic teacher. Then the rest of us are all women. One person some years does up to eight lessons of social studies, but that links well with geography. She is a graduate. Active in the NUT and that tends to prevent her from doing much, sort of original work (laughter) and then there is myself.
- Q. Give me a pen picture of yourself.
- A. I taught eight years full time, 4 years part time(P/T), at a 'Midlands Girls' High School for 1 year (Grammar), A London School for Girls for 3 years (HOD)(Grammar), then 11 years off then 4 years P/T at a local Girls school (selective but becoming comprehensive) and then have done nearly four years at School 1F - the only comprehensive school I have taught in, the only time in a co-educational school, the only time I have taught low ability children.
- Then there is the next F/T geographer, again a woman who has had a whole lot of teaching experience, ... has done a lot of work with low ability children, counselling, youth work, and has only been at School 1F for two years. But she is very enthusiastic and energetic in the department and the last member of the department teaches PE and geography, is a keen geographer willing to participate in everything that's going on and she has a geography degree and a PE qualification and she does give a lot of time to the geography department although, obviously PE cuts down on her time, she's very helpful on fieldwork and so on.
- Q. In a nutshell how would you describe this department?

- A. We are not a cohesive department. Four of us work very closely together on sharing materials, swapping ideas, discussing children and then two stand separately from the rest. The HOD who very seldom gives guidelines, very seldom consults with us but leaves us three to follow our own interests. So, em, because we are on the whole enthusiastic, it works but if we had a department of less enthusiastic people it could fall apart.
- Q. To what extent is there contact with other geography teachers within the borough and with the adviser?
- A. Well, it tends to be remote because if there is any paper contact it is done with the HOD who doesn't always pass on any information so we tend to have very little contact outside except people we meet socially.
- Q. What about the LEA 1 GA?
- A. The Sixth Form ... it is very much geared to Sixth Form .. but of course it is useful for teachers to go to encourage the Sixth Form (laughter). It is good - we gain a lot of information and keep up to date.
- Q. What sort of resources does the department have - books, teaching rooms, reprographics facilities and so on?
- A. We have two geography rooms, and an associated stock cupboard, which take a full lower school class and then we have one other room which we have had for most of the time I have been on the staff and it is used for the Sixth Form, since I am a Sixth Form tutor I use it. I have this room with its own stock cupboard and that's well equipped - we are well stocked with Sixth Form books - everything I have asked for has been provided in the way of books.
- Q. What sort of budget does the department have?
- A. I'm afraid I don't know.
- Q. Why are sixth formers so well served with books?
- A. It is because numbers went up rapidly four or five years ago and we changed from AEB to London.
- Q. Do you over/underspend as a department?
- A. No, the HOD is cautious and would never overspend. We have Young and Lowry in the Fourth Form and Dobson and Virgo Europe in the Fifth Form. We have got quite a lot of floating sets of various books and gradually over the last two years, Young and Lowry's 'People in Britain' has been replaced in the First Form because of pressure from staff. We have Sense of Place ... the HOD favours that Philip Sauvain British Isles which is in fact very similar to Young and Lowry in its format and pattern. Various floating sets of 60 books have been bought for instance the OGPs.
- Q. Where does the geography department stand in the context of the borough?

- A. Nothing is ever thrown away and so alongside textbooks the staff supplement with their own staff produced resources and that makes it quite a good department really.
- Q. How is the morale of the department being affected by threats of closure, redeployment etc.?
- A. Er, morale is very low at the moment because, ehm, the HOD is unlikely to go and unlikely to be asked to go because he has been there so long and out of sheer humanitarian grounds I don't think he will be asked to go. The head of Sixth form obviously is in a fairly protected position and the PE staff are understaffed at the moment so it means there are 3 of us who are likely to go and it is very bad for morale especially as it is likely to be the end of the year before anyone knows what is happening.
- Q. Is it the worst possible time then for curriculum development? - low morale, HOD etc.?
- A. Yes - the HOD even considers aims and objectives unnecessary and little can change until this gentleman retires.
- Q. Would you consider it one of the least progressive geography departments in the borough?
- A. Yes because one or two individuals cannot carry the rest - the whole department, you can't give a departmental image.
- Q. What about computers in the school?
- A. The 480Z network is being increased from 8-13. There are also several separate 380Zs. One 380Z is on a trolley and can be moved around the ground floor of the building to classrooms. The network is in one room and since September (83) the other machines in a separate room and the word processor is in there too. That is used by the business studies department quite a lot. The network is used by the maths department and the computer studies 'O' level group but the other machines are in a room that can be booked, but only 1 machine can be taken out, (6 classroom and Upper Sixth Room where it can be used). There is very easy access to those machines for sixth form use who are free to go and use them during private study and staff of course if they want to.
- Q. Are there computer awareness courses lower down in the school?
- A. No, that is done by a computer club, er, it is so popular in the lower school that the first form club, ehm, I think they only get a turn once every 6 weeks, but the numbers drop during the year and the second form computer club meet every 3 or 4 weeks and they are given half an hour, what you might call a lesson at lunch time and then they are allowed to 'play' after school but they have to do both so the computer teaching is done in that way.
- Q. You take a Sixth Form group to the 380Z room then?

- A. Yes, but its a bit overcrowded because it tends to be where they put their spare equipment and put their trolleys in there ... but you can manage to book it.
- Q. How were these machines acquired?
- A. Well, the list goes on. We have acquired a BBC with a lathe attachment for the technical studies department and there is one (I think it is a BBC) in the physics department but they are inclined to pinch computers from other places and whip them off to the physics department... The 380Zs tend to be the older machines and have been there since micros were introduced to the school.
- Q. How were they all funded?
- A. There has been a lot of help from the PTA. It's a very affluent PTA. They work very hard, they raise a lot of money. They bought the school minibus, ehm, they are keen on buying obvious status things ... like our school has so many more computers than anywhere else and so on. This is their driving interest.
- Q. The head has similar feelings does he?
- A. Yes.
- Q. Who is in charge of computing?
- A. Until 4/5 weeks ago it was Bob Thompson who is head of RE who was interested and he had no time allowance for it at all.
- Q. Nor a scale?
- A. No, he already had his HOD (salary) but he was keen and enthusiastic and has worked quite a lot with Neil Pope and people like that. It was a hobby that became used by the school but they have now appointed a member of the maths department to be head of computer studies. He became vigorous in his applications for head of computer studies elsewhere and so it was realised we needed a head of computer studies and presumably the borough sanctioned it and he had been teaching computer studies, sixth form, anyway and from next September there will be a small 'O' level fifth form computer studies and he is hoping to build up to 'A' level computer studies which isn't possible at the moment of course. He has a dozen doing computer studies in the sixth form and they all get 'A's. The new department (computer studies) will have an allowance and the computing materials individual subjects will be financed from this department. they won't come out of individual departmental funds which for geography is going to be marvellous because he is keen, he knows what's available.
- Q. Which other departments use the computers?
- A. The Maths department use it obviously and between them they run this club. Economics use it occasionally, I use it in geography but nobody else has used it. We have got very limited materials, ehm, the physics department use it. They have limited knowledge themselves but use

sixth formers who have computer knowledge and set holiday tasks of writing programs and things.

Q. Has there been a lack of guidance/co-ordination then? (re educational computing in the school)

A. Yes, because there hasn't been a HOD. It is/has been done with the goodwill of the head of RE - with fanatical enthusiasm.

Q. It seems there is no lack of hardware and timetabled space, access to machines during the school day?

A. Oh yes - I have never had any problems with the one on the trolley I can take away when I like.

Q. What about geography and CAL?

A. Well, I'm the only one who has done anything about it until now though one other member of staff is going on a course. The HOD bought the Schools Council folder because he was told by the head of RE department he ought to buy that. I am the only one in the department who has ever used the materials at all. We have had it for about a year and it was put away, and I didn't know we had it but last summer took the folder home and started work on it.

Q. What have you used?

A. I have used it mostly at sixth form level because I too am learning and I have used DEMOG particularly. The drainage basin looks good to me but I do not normally teach physical geography so I haven't used that at all and I haven't used the status one. But most of the other programs I have run through personally, to use when appropriate but of course from the types of programs, I must keep within the syllabus loosely.

Q. They don't necessarily fit your curriculum?

A. No - the farm game would fit with bright first years possible to adapt for youngsters but I haven't reached the point of doing it. It bothers me with a remedial group that because .. with one computer on a trolley, their lack of ability to participate, is quite great but the others - it's quite difficult to work into our existing syllabus ... especially this third form devoted to physical geography.

Q. So for various reasons the sixth form is the way in?

A. Oh, yes, yes.

Q. And nobody else has shown any interest at the moment?

A. The new head of computer studies removed the file (the Longman suite of programs) and has looked at it to see what we've got, ehm, the only other things I have got .. I've put into the file GEOFILE programs, ehm, I haven't typed them in. I am hoping to persuade somebody to type them in for me (laughter) at school because there is no problem about cassettes - typing things in.

- Q. Can you tell me about the meeting organised by the adviser a few years ago?
- A. Well it was well attended. There was a problem that the software and hardware were not compatible so we saw very limited number of programs (laughter).
- Q. So it was a disaster really?
- A. I'm afraid so. We saw a few programs that were quite interesting.
- Q. So you wonder if it set back this particular development in the eyes of many geography teachers in LEA 1?
- A. Ehm, I wouldn't have thought it did that, ehm, I think it pointed out that you have got to check that your hardware and software match, ehm, but I think it was a pity that we only saw some of the older programs ehm, and of course, there have been a lot of improvements and some of the older ones are very sketchy.
- Q. What about later programs that you have become aware of?
- A. Apart from the one we saw at London GA, ehm, (1983) I was impressed by Jennings, the Scottish gentleman, they were very good, a lot of useful material. I think there seems to be a lot of overlap at the moment some programs I saw at a local GA they had a meeting at a local independent school where the head of geography is very keen and he ran some programs there and talked about how he used it and that was the most useful thing I have seen because he talked about how he organised a class, how he organised the work. Ehm, not always applicable to a comprehensive school because his is a selective school with small groups (Martin Bland). He is enthusiastic, has a lot of resource material there and it's all up to date.
- Q. Have you found Teaching Geography useful, or any other source?
- A. No, I think the main thing is to be able to see the programs run, to be able to assess the programs. Plenty of publicity materials come through but it is very difficult if you haven't even seen the program, it is very difficult to assess it ... It is not like a book display where you can look at the books - you need time.
- Q. Has anyone else in your department of 6 attended any computer course?
- A. No, no - well the head of sixth form went to the local GA meeting and one other member of the department is going to do an evening course at school 1G at the end of next term ... it is a computer, local authority evening class.
- Q. What have you heard of MEP?
- A. Nothing.

Feelings about statements:

- a) No, disagree.
- b) Well that doesn't apply to school 1F because we are well provided for - so strongly disagree.
- c) They are improving (laughter).
- d) As for as our syllabus is concerned which is not like most syllabuses (i.e. she implies it is old fashioned) I would agree that they don't suit.
- e) Strongly agree.
- f) Oh, no I disagree with that.
- g) There is more to it than that isn't there? (laughter).
- h) I disagree that it is limited but it is like the filmstrip and video - you have to use it within the context.
- i) Agree it does take a lot of time, yes.
- j) No, I don't think so - it won't transform the classroom, is it something that needs to be integrated with everything else.
- k) Well, I disagree because it is there if you seek it out.
- l) Yes, it's part of their world now and that's why I think it is important.
- m) Yes.
- n) Strongly disagree.
- o) Well, yes, I agree - right.
- Q. What is the present situation and likely future of CAL geography in your own school?
- A. I think it depends very much on what's going to happen within the department with redeployment and staffing because under the present HOD it's likely to make no progress. If one of the two of us who so far have shown some interest so far are redeployed it could die a death completely and this folder could gather dust. So much will depend on staffing. If there is a new HOD who is keen - it could be developed because really it is a question of someone who has the authority within the department saying look come and look at this and see how it works and making the others sit down and find out how to load the disc into the computer, which button to press and so on.

Appendix 5.2

A further example of a transcribed interview

Sara Norris School 1F

20/4/85

At Sara Norris's Home

Q. What is the geography staffing situation in the school now?

A. We've lost one member of staff, I'm now head of department, there's one person doing full-time geography, one doing geography and social studies, one doing geography and games and one who is head of sixth form and also teaches maths and geology. The head of the department left, he retired very suddenly at the end of the summer term. None of the part-timers are doing more geography but we've all lost free time - we now only have four frees each out of a 35 period week.

Q. There was the threat of re-deployment on 3 of you - this was obviated by the head of department leaving so the pressure on geography staff was gone?

A. Eh.. No not until the end of the summer term - he didn't decide to go until 2 or 3 weeks before the end of term, he'd been told that if he decided to go he could go without using the normal notice time he was only 61 and asked for enhancement of his pension its rumoured that they lost papers so they refused enhancement and he appealed and they didn't hear his appeal until the end of summer term, so they waived the giving notice.

Q. Last time I spoke to you there seemed to be no likelihood of him leaving?

A. No, because he didn't think he would get enhancement and in fact he didn't, but he obviously decided that because of family pressures that he would go.

- Q. So in fact throughout the year, until the last minute, it was a very unsatisfactory environment within which to work.
- A. Oh yes two of us were asked to go for interview for a scale one job at another school in the borough which is due to close and it wasn't even a geography job. It was integrated studies. That was in the last half of the summer term.
- Q. Did you both go for that?
- A. (laughs) No he retired in time, I think actually that was the thing that in the end pushed him to make up his mind - it was such an impossible situation.
- Q. In terms of the whole school, how many staff are being lost each year?
- A. Last year we lost four, this next year we've got to lose two. Last year, in the end, two went from languages, one from geography and one from history - it was intended that music should lose one but in the end it wasn't as it would have meant there was only one musician in the school. As a result languages lost instead which meant they lost 'A' level in various languages like Spanish.
- Q. For the majority of staff the threat of re-deployment hasn't moved much in the last year - its only for one or two staff?
- A. Last year it seemed very, very dominant because so many people were involved (six in geography six in history and eight in languages and two from music), this year its less dominant because last year I was one of the subjects and one member of staff had already left and been replaced by a temp.
- Q. What about geography in the last year or so - has it stayed in the position that we discussed? Has it retained its popularity?
- A. Really the sort of judgement time will be in a week or two when we see the take up for next year. At the moment we seem to be very over-subscribed on third year options it goes into several option groups and we have one option which just wouldn't be teachable with the number of staff. We've got enough take-up for two sixth form groups mostly

because the head insists on it being offered as an art and a science so it goes into two options. Yes its maintaining its popularity, we do take a lot of sixth formers in from other schools -we lose all out best 'A' level pupils to the sciences.

Q. Presumably since you took over in September you have not had enough time to breathe let alone change courses and this sort of thing?

A. No, I did manage to get the second form syllabus changed slightly, I had very little money because the previous HOD had spent all the year's money! So I started the year bankrupt. For some reason I think he decided that the best thing to do was to spend. Most of the changes we weren't consulted on - a lot of it was adding to books we had already. He did buy enough for two sets of 'Sense of Place' we had enough for two classes of book one, he bought another two classes worth of book two. I managed to persuade him to equip the whole year with that so that I could get rid of Young and Lowry -its a similar syllabus but its altogether more lively and up to date and without the rather racial aspects. In the fifth form I've twisted the syllabus round so that instead of having the emphasis on Europe I've put the emphasis on the world problems part of the 'O' level syllabus, so that the Head insists that everyone goes on, if at all possible, to do an 'A' level now, and the world problems is more for the CSE pupils. So these are my major changes.

Q. How is your management style going to be different?

A. Well, it's very difficult to tell. My department is, at the moment, beginning to disintegrate around me, there's a possibility that I shall lose 2 members of staff, and my scale 1 full-time Geographer had been refused a scale 2 by our head, for a variety of reasons. So she's looking for a scale 2 within the Borough, she doesn't care where she goes, but it's time she had a scale 2, which is fair enough, she's moved alot because of her husband's job. She's a very experienced teacher, but she's moved from one scale 1 to another.

Q. And she feels it's about time she got a 2. So it will be a new start, perhaps?

- A. Yes, that would, in many ways, be a good thing, because it was so easy going, and everybody did what they liked. It's quite difficult to impose one's will.
- Q. What objectives have you got for the near future?
- A. To make an integrated department that works together, rather than as 5 individuals doing what they please.
- Q. And that's going to take a while, isn't it?
- A. Oh, yes, it's got to happen very slowly, and as tactfully as possible. It's been held up to a certain extent in that I had from the end of November to half-term in the Spring term, I was without one member of staff, because she tore her Achilles tendon, and so I had a succession of general supply teachers, which was totally disastrous, and it wasn't until the end I managed to convince everybody that there must be a Geography supply who could teach and mark. In a way, that helped towards the management problem, in that some changes went on.
- Q. Can I ask you about, generally, to do with the school in the last year? Obviously, there has been increasingly this action, industrial action. Has it had any effect on people's commitment to out-of-classroom activities, and general feeling about their job, and people perhaps looking for alternative occupations?
- A. Not many people like to get out of teaching. A very very low morale.
- Q. How do you quantify that? What are the symptoms?
- A. A reluctance to take on extra things. The phrase is 'if you do that, it will become custom and practice', stemming from the letter that most teachers in the country had about what was custom and practice. Don't do fieldwork on Saturday, it will become custom and practice. In effect, it's been more talk and misery and fed-upness than actual physical direct consequences.
- Q. But, overall, the environment in the school is fairly happy and positive?

A. I think School 1F has been a school where the staff are all still there at 5 o'clock. and I think that in the Spring, partly because of bad weather, and partly due to people's attitude, there was very much more of a tendency to be out by 4 o'clock. Not because of activities; I mean people were hanging around, discussing things, marking, working there, and I think the combination of the bad weather and the industrial action had meant that people have been off the premises much more quickly. But it's had very much less effects on thing than in the Summer. We're fairly evenly split between the 3 unions, so any action tends to be ineffective. If one union does one thing and another does another, and the third are doing another thing, it's a relatively small amount of impact. People felt that, because of the split between the 3 unions, in the Summer we tended to be getting nothing from industrial action but trouble for ourselves. So that unsupervised children at lunchtime were more difficult to teach in the afternoon. We trained a team for X weeks, and somebody said a fortnight before the vital competition, 'you've got to give up your practices', and people refused to do that. Some union shift, a movement away from the more ... The PE people moved en masse to the PE Teacher's Union, which is mostly just concerned with insurance cover for them, because they had worked all winter on teams coming up for Easter competition, and felt that they just didn't want to give up out-of-school activities. So there's been a bit of movement like that, a bit of movement away for people who refused to strike, who felt that if the miners had been ineffective, the teachers were going to be ineffective. I think it's effective in a school where one union is dominant.

Q. Can I move onto the wider situation of computing in the school? Have there been any changes recently? For instance, you mentioned that you had a network of 480Z that was being installed in the school. Has that , the hardware side of things, changed for a start?

A. It went up to the 13, and in the Summer they were all put into one room, the wall was knocked down, and so you had a teaching room with the network in, and a computing room, instead of 2 smaller rooms.

Q. You had a very strong series of computer clubs for different years. That's presumably still very strong?

A. Yes, but the industrial action has affected that.

- Q. Have there been any computer awareness courses set up for the under-16s, upper-14s?
- A. No. Increasing amounts of, particularly maths teaching, are done in the computer room, so that the maths department tend to have it timetabled on a year basis, to that there are some lessons that are committed to that. 'O' level Computer Studies was introduced for the present fourth-year, who are '85 now, so that's this year. That's going again next year, it's going to have to go because of staff cuts.
- Q. Even though it's a new addition. You then said that possibly there would be the opportunity eventually of developing some sort of 'A' level Computer Studies, which is obviously not possible now?
- A. Presumably the present fourth-year will go on through the fifth-year, and they will possibly be in a position... but the maths department are very hard pressed, and already have to use a physicist, geographer etc, for their school teaching. That's going to be cut. The Physics, it looks as though the cuts elsewhere will have a knock-on effect.
- Q. You seem to have a room that has lots of individual micros one of which could be actually taken out of the room. You still have such a room?
- A. No, because we've lost that into the bit when (indistinct). There were 2 separate rooms.
- Q. So what happened to the individual micros then, the freestanding micros?
- A. They are still in the room with the network, so in fact from our point of view, we've lost a teaching area, because you no longer have anywhere where you could take a sixth form group separately.
- Q. Has there been any extra increase in micros?
- A. No, not since the technical department, that was the last one.
- Q. It seems that you had a member of the Maths department who was appointed to be in charge of computing, in the Autumn of '83. And one of the reasons, you suggest that he got the appointment was that he was

being active in looking for alternative appointments in computing in the Borough elsewhere. He got the appointment. What sort of impact has this person had since Autumn '83 on educational computing in the school?

A. Nil, I would say.

Q. Would you like to elaborate on that in any way?

A. He is not organisationally good. He is very good at computing, and he's very good and enthusiastic. He seems to manage to convey his information to his pupils very well indeed, but he's not very good at imparting information to the staff. Out of fairness, he did make some attempts to get other departments involved in computing. He found it very difficult to impart his information to other members of staff; I think he couldn't accept how dim we were at computing, which made it difficult. We had a one-day strike and he used that strike, when pupils weren't there, as an opportunity to talk to the staff and so on, which was very useful. But apart from that he hasn't done anything. Normally, without any distraction, he finds his own commitment all he seems to be able to cope with.

Q. Who else actually teaches computer studies?

A. Only this one person.

Q. What is his view on the use of computers across the curriculum? Is he really a computer studies person, or does he have a wider view of the use of microcomputers across the curriculum?

A. He would prefer to keep the microcomputers for computer studies. I don't think he wishes to share.

Q. Slightly elitist?

A. Yes, you have to fight to get computer time.

Q. What is his title?

A. He's head of computer studies.

Q. Not head of educational computing?

A. No.

Q. How does the Head see his role? Does the Head have any discussions with him, as to quite how he should develop educational computing?

A. I think the Head is totally unconcerned by the whole matter. I think that he likes to say 'we were the first school in the Borough who had a network of 13 computers, good old PTA, good old Borough, look at our lovely computers', but he's not interested in it.

Q. You feel that he lacks vision in terms of possible policies?

A. Oh, yes. He thinks it's a gimmicky thing, really.

Q. Do you get any information from the Computer Studies Head of Department, any newsheets, and information at all about local courses, publications, software, from that Head of Computer Studies?

A. No, no.

Q. So you have to find out this for yourself. So there hasn't been any obvious greater co-ordination of the use of educational computing?

A. No, in many ways less, because before he became head of computing studies, the head of RE was involved, and he was much more interested in the wider applications of educational computing.

Q. He no longer has a role, then, in computing in the school?

A. He goes and has his little plays!

Q. What about the head of computer studies, has he bought any software for geography, for instance?

A. I'm not at all sure that there's been any new software since I last talked to you, TRANSPOTS, things like that, we have, I think, I can't remember when we acquired them, but we acquired 1 or 2 new programs towards

the end of last year, that were offered by the previous Head of Department. The arrangement is that they are partly paid for out of SE, partly from the Computer department, half and half, up to a certain expenditure. About £30.00

Q. So, potentially you could share it £30/£30?

A. About 30/30 would be on last year's allocation. Out of fairness to the head of computing studies, he saves certain sorts of things. He saved pages of ARCOL, about climate figures that he had. He saved those, but he didn't tell me he'd saved them! I found out by chance that those had been put onto the Geography disc.

Q. Can I ask you about eography and CAL? One of your members of staff was going to go on a course; did that person go on the course, or any other courses?

A. Yes, she's the one who is my potential leaver. She is the only one in the department in whom I have managed to arouse any great interest at all. She went on her course, she was a little bit disappointed in it; the person who was running the course was very, very involved and knew what he was talking about but, again he found it difficult to get down to the less able level of the teachers he had on this course.

Q. Because wasn't she the lady who, in fact, taught quite a number of less able groups?

A. Yes, that's right. She went on her course....

Q. What was this course, was it residential, day..?

A. No, it was a Borough evening course.

Q. For Geographers?

A. No, I don't think it was even for teachers. It was just an ordinary FE computing, people who are interested type thing.

Q. At the local college of FE?

- A. No, it was in a school, most evening courses go on in schools.
- Q. So it was for anybody who's interested, more of a Computer Studies type of exercise?
- A. Yes, elementary computer awareness. And a little bit of hands-on experience. The main development in the year has been Mr David and Martin Moseley, getting together computer groups in schools.
- Q. Tell me, what is your perception of that?
- A. I think it's an excellent idea. It was very good initially to get together and find out that all schools in the Borough have similar problems of access to computers, Computer Studies and Maths departments hogging it. Things being recorded taken from the initial discs and put on the discs for the network, and to people who are fairly ignorant over stock, it's seemingly becoming inaccessible thereby, because system changes, so everything is re-recorded on the new network, so the instructions are all different etc., etc. And it's obviously a Borough problem, not an individual problem.
- Q. So sharing those problems was valuable. What else do you remember of that first meeting?
- A. Well, it was mainly an introductory meeting to discuss what we were going to do, and how we were going to do it; what the Curriculum Development Centre were going to do in terms of acquiring materials; what could be copied free of charge, and the idea was that we would get together, and we would look at programs together and discuss whether we thought they were worth purchasing, with the rather sad tale that, of course, educational programs still lag far behind commercially produced games and graphics and so on.
- Q. So what came of it, that meeting?
- A. A second meeting, which virtually failed because of industrial action, and a third meeting fixed for the end of the Summer term, when we are hoping that the industrial action will be over and something can then progress,, because I don't think one meeting a term, an hour a term, is going to achieve anything.

- Q. What is your evaluation of this initiative?
- A. Brilliant, really. That sort of thing must be done, I think. A combination of effort and evaluation of the programs, and of ideas and worksheets and so on. A morale booster in terms of persisting, really.
- Q. What is the authority going to do for you , apart from facilitating a course at the end of the Summer term, and in a sense it looks as though Martin Moseley has been given the job of co-ordinating this. What else is the authority doing for you?
- A. Acquiring software.
- Q. So, if you see a piece of software, you can ring Mr David can you?
- A. Yes, and they can acquire it and we can look at it, and the idea is that we could borrow. Of course they are nervous over that, in terms of copyright and so on.
- Q. Did you get any input from the educational computing advise fellow, Paul Gower, at that meeting?
- A. No, he wasn't there. It was Alan Shalecross.
- Q. What did he say, what was his contribution?
- A. He made the point that he felt that Computer Studies people were making it difficult for the rest, and one must fight for one's rights in computing. And he obviously, in the school he's at, is in a way dominating the computer, so the domination is not from the Maths department, there, but from him. Interesting, but of course it was one brief meeting in the Autumn term, it hasn't got off the ground really.
- Q. At 1F, you've mentioned that in the class with sixth form groups you've used DEMOG and the FARM GAME, I think perhaps your colleague had use that.
- A. It was FARM GAME in the first-year, yes, I'd used that.

- Q. Have you bought any more programs, seen any more programs, used any more
- A. We've continued to use them with the sixth form and develop those. We've looked through quite a lot, is TRANSPORT and INDUSTRIAL LOCATION one?
- Q. You're using that with the sixth form then?
- A. Yes.
- Q. So that was one you've bought, since I spoke to you. But you had the original pack of DEMOG?
- A. That's right, we've still got that, obviously. But we've really progressed very little in teaching, except using what we've got with the sixth form, and using the CLIMATE one. That's very useful one with sixth form groups and we still use that, but apart from that we haven't really made very much progress.
- Q. What have you noticed generally about Geography software and the developments in such software?
- A. The amount has increased, but I'm not at all sure that I think the standard has actually increased. I think a tremendous amount of personal preparation is needed to use a program, particularly at the sixth form level, and it provides just a fraction of what, what the sort of, input of the topic, and that's where the chief problem lies. Obviously, once you've used it once, and you've done all the basic preparation that you need to do yourself, and got it to the point where you can present the pupils with what they need beforehand to use the program, then you're away, sort of on a permanent basis. But it's so time-consuming in preparation, which is what I hope that the Borough group will eventually be able to pool, because as Geography teachers in the Borough, we don't yet communicate in a lot of areas, and there's a lot more could be done in terms of co-operation. We tend to be very individualistic.
- Q. Can I ask you about what you hear about the software that you mentioned, and the greater range and so on?

- A. Publisher's leaflets.
- Q. Teaching Geography, does that have any impact on it?
- A. I suppose it does, but mainly publishers' leaflets.
- Q. I mentioned to you about MEP last time. It's obviously something that hasn't come down to many people, Micro-Electronics Education Program.... you have no documentation?
- A. No.
- Q. What about the GA conference? Within the last year, have you..?
- A. Not this year, no, I didn't.
- Q. What is your view as to what will cause take-off of CAL Geography in schools? More of the integrated use of microcomputers in Geography classrooms?
- A. It's difficult for me to judge generally, but speaking from my own department, within the department as it is at the moment, the only way seems to be for me to do the basic work and present them with the materials, because they're not interested.
- Q. That's true generally, is it? It's not just the use of microcomputers in their classrooms, but that's just generally?
- A. Oh, no, I think it's because of the amount of work that's involved. You can stick a video in the machine, and you can use a filmstrip and they're happy with that. In a similar way, they don't use the sand-tray all that much.
- Q. Because the time and effort required is too much?
- A. Yes, which is understandable, when (inaudible) .
- Q. Can I ask you about LEA 1? Having worked in LEA 1 for several years now, and in other education authorities, how supportive is this authority

in your opinion, to teachers engaged in curriculum development? Where does it stand?

A. Mr David is very supportive and is very active, but the Borough as a whole is not.

Q. Can you fill that out a little? In what way is it not?

A. There's a lack of in-service courses, a lack of finance, a tradition ... I don't know, I may be a bit unfair. The school I am at is very academic, and the Head is very isolationist from the rest of the Borough, so it could be that it's that.

Q. And perhaps the staff are not encouraged as much as other Head Teachers might?

A. Oh, no, no. Curriculum development is still a bit of a dirty word, and there's no-one in charge of curriculum development.

Q. There isn't a Deputy Head who does that sort of thing?

A. Oh, no. (Inaudible) at the beginning of the Spring term, who said that surely there must be someone in charge of curriculum development, and there isn't. So, I think maybe that colours my view.

Q. The picture you seem to be painting is that Mr David is making efforts and is trying to facilitate developments, but within an atmosphere that, traditionally, has not supported these sorts of developments?

A. Yes, that's true.

Q. Can I ask you about the Curriculum Development Centre? Is that going to make any difference to you?

A. I hope so. It's very much better than, we've moved from (inaudible) to (inaudible) and it's very much better, and very much more organised. I think there's a limit to the amount David can do in charge of Humanities. His sixth form courses seem to be getting off the ground, that's going to become an annual event, and his interest in the sort of in-service course teachers want.

- Q. This Head of Departments' meeting, which you take part in, is presumably an annual event is it?
- A. No, it's a termly event, which is very good considering that's Geography, History, RE and he's doing the three. In a way, he can't spread himself sufficiently far, and I think, to a certain extent, there might be something to be gained from having the Heads of Departments' meetings more frequently, half-termly, instead of termly. It wouldn't be possible for him. That's a tremendous source of information and progress, really, and it's curriculum development available, through him.
- Q. What are Geography teachers' perceptions of him, how do they see him? Because there are often very negative feelings that teachers have about advisers.
- A. Those of us who've had contact with him, have a very high regard for him, but then he hasn't had close contact with many members in our department, only really those of us who were lined up for re-deployment, and not everybody connected with that, only those who wished to make contact with him.
- Q. So it may be that many Geography teachers within the Borough don't know him haven't met him?
- A. Oh, yes, I think that's probably true.
- Q. Because one of the criticisms has been that he's not in the school, a lot of people comment.
- A. He visited us quite frequently, but I think Heads do their best to keep him out of the classroom, as they do with HMIs and anybody like that. I have contact with him, because of Heads of Departments and I had contact with him before, but it's true that I don't think he's ever been in my classroom, or in any other member of my department's lessons. He comes to the school, but the Head keeps him away from contact. He would do that, the HMI... I had an HMI come at the beginning of the year, and the Head sort of promised me that he wouldn't come near me before break, and he would be removed! It's very difficult, the Head stands between the outside agencies. I think they genuinely consider

that that's the best thing to do. Very interesting, I was promised Mr David would leave before Period 7, and the only lesson he come into was my last lesson.

Q. Can I ask you two final questions. Have you got any view as to how the Borough is coping with educational computing? What is your perception as to with Gomer and the other chap you mentioned,(Shallcross) and any other influences, what is the Borough going to do with educational computing? As a resident, as a parent, as a teacher, have you got any views?

A. It seems to be mostly a question of acquisition of hardware. Perhaps the Borough sees itself in the same way as the Head, 'we have got 7 computers, and every primary school has got...' . In terms of money, in that if the PTA will provide 50% of the money, the Borough will top it up. It's middle-class, most PTAs will fork out that amount of money.

Q. The question was to what extent has Mr David and the boys (Her own children) in their different ways affected your thinking about the possible use of micro-computers in geography?

A. I think that's almost impossible to answer because it's a sort of thing you absorb without realising. Perhaps that's why I'm more interested than anyone else in the department. Perhaps the only other person that's at all interested is the person with two young boys and a husband also interested in computing, through work and through play. It has shown me that er that other schools they have the same problems as we do of access and computer time and so on, which is encouraging er one doesn't wish to disrupt a staffroom but the point is obviously that one has to fight for computer time. Not just class computer time but access, time to look at the program that sort of thing. Particularly industrial action, I think one of the chief problems is security a computer brings. The room must always be locked. The number of keys for access. The security problem makes access really quite difficult. Two people have keys to our computer room, five separate keys to get in the computer room, with industrial action the keys go off the premises you see.

Q. Because you said last time that in fact it is fair to say that you've got a facility there that is not used 100% of the time. You did say that last

year, now that could be because you had two separate rooms and now you've got one room and the pressure on that room is great. .

A. Yes I think, apart from the industrial action which is rather annoying, but yes. To go back to the point about computer awareness and families the more I think about the question the more it is that it's only two of us who are interested that have got husbands who use micros and children who use micros and the other three are not interested and have no other contact outside school.

Q. And therefore perhaps its not just the knowledge, its the confidence?

A. Yes a sort of (inaudible) way I suppose.

Q. Thank you very much. That's marvellous

Tom David's judgement as to 'innovator' departments was borne out by subsequent data. When (on my behalf) he sent out CAL Geography questionnaires to all secondary school HODs the 15 schools not researched into (i.e. 15 out of the 22 in the LEA) had either no programs or CAL activity or a minimum of either.

Appendix 5.3 Portrait of School 1A

School 1A 26\11\83

Background

School A is a girls comprehensive sharing a sixth form with the adjoining boys school, (School B). It used to be the local girls grammar school.

Interviewee

Mrs Rolfe is the head of the geography department; has been at this school for four years, though has been a head of department since 1972; in her late forties; and is a Cambridge graduate. "I am one of these camp followers with my husband you see", she explained. (She is the wife of a head teacher of a mixed comprehensive school in an adjoining borough.) Her previous post, which she held for many years, was as head of department at a grammar school in East Manchester. "I might be described as slightly traditional, " she remarked.

Her knowledge of computing in the school is sketchy. For instance, when asked if computer studies was on the curriculum, she replied after a considerable pause, "Now I'm not aware of that. The first forms are doing some computing.... some sort of awareness course I think it's coming in the maths..... think the maths are doing it.... but to be honest I didn't know you were going to ask me that so I am au fait with who's doing what."

When asked about her own use of computers in geography, she answered, I used it, either two or three years ago... ..so I actually for two years running used the MORPHO program with the lower sixth but it was very time consuming

you see and to my way of thinking there was a basic error.... I have looked at the others. There is an error in the CAPITAL CITIES and so we haven't done anything more on it..... I had another go at it the other day....it is too time consuming (MORPHO).....The last time I did it was two or three years ago with a lower sixth group.... The students quite liked it (a begrudging admission). I wouldn't mind if the drainage bit was less time consuming, rivers go on and on and on, I've been at it for about six weeks already and to fit another element would be difficult. "She was asked if she was aware of any other geography programs. "I've seen the WEATHER one at the GA Annual Conference....In particular courses we do it wouldn't be suitable because it's meant for fourth years and I suppose, all right, it might have something useful but I haven't seen anything I wanted, I mean now there's this room if there were certain games.... I wouldn't mind having a go..... you know because one plays games of one sort or another..... I am not aware of any other marvellous." She 'sent' her colleague Mr Pye to a meeting for heads of geography (within the last year and about computers),"and he came back thoroughly disappointed.....his reaction was there was nothing there for us." Asked about other sources of information about programs, she replied, "No. My mind is blank on the issue." (even though she does get the TES and Teaching Geography) She mentions that the Cambridge A level syllabus has a great deal of "very, very statistical exercises.....I mean if someone did a good A level geography program that would suit me fine because I am obviously post statistics in the sixth form. The potential is there.....I play the farm game..... but it's a bit limited". Her attitudes on the use of computers in geography are clear. She feels the progress she has seen are of low quality. "Except the sixth form I haven't felt what I have seen or heard is useful except for games. " She sees only limited educational value in all this. "We have so many other things to do haven't we? "It is ridiculous she suggests that 'CAL could transform the geography classroom of the nineteen eighties'. She does not see computers as a motivating force. "I think they (pupils) are motivated more by pictures and things". She agrees "that

in the present world of 'cuts' CAL and geography should take a very low priority." Asked why she didn't engage in CAL and geography, she responded, "I'm not going to start making software..... I mean I'm working every night." A colleague in an adjoining school who is very statistically minded has spent 24 hours " doing some software for a first form on ordnance survey symbols you know." (laughter) She clearly feels the benefit for the cost is too limited. ".....spending that amount of time for one exercise. "(laughter) "I don't want anything as time consuming as MORPHO or as stupid as with full of errors as some or other of the others ones I saw early on you see. "There is no constraint in this school on access to computers according to Mrs Rolfe, "No, it was a constraint when we only had one (computer) in the sixth form block.....but if the numbers grow (which they have) then more can have a go. "Her confident approach is halted by an interesting aside, "....I mean I was just totally inadequate. "(comment straight after the admission that access to computers was no problem).

Geography Department

Geography is less popular in this school in comparison with the adjoining boys school since "biology is successful competitor.....and also commercial courses are popular with the girls of a similar ability to the boys who take up the subject". (She is speaking of the middle to low ability levels). The A level course followed in the school is the Cambridge A level syllabus regarded nowadays as one of the most conservative, not having been changed for many years. No great, (apparent activity here to do with computers and geography. MORPHO was used with the sixth form for a couple of years by Mrs Rolfe. She has also used a farm game with the first and second forms "but it's a bit limited". No indication of whether colleagues use computers or not. (Though it is not clear if this head of department would be aware of such activity anyway)

There are three full-time geography staff including Mrs Rolfe. Mr Pye (late twenties with a Bed) "in some ways is more traditional than I am", does not appear to have used the computer. The newest member of the department has been teaching for two years, graduated from Kings College London has said "She would be quite interested to do some computing though she hasn't done any". The deputy head teaches some geography and "is very familiar with computers..... has done lots of computer courses.....I know he is very familiar with all this". (Though no effort is being made to use this apparent expertise!) Overall there is no policy to do with computers and geography or any feeling of a need for such a policy. No constraints were mentioned apart from the view about limited software.

The School

The head was not mentioned as having a policy or vision about computer. At present the head of physics is i/c computers but "is obviously pressed.....but I think at some point a head of computing will be appointed..... they are waiting for another point from somewhere.....I overheard there is going to be a full scale 3 head of computer studies at some point. "The head of physics, "I meet over lunch and I say let me know if anything comes your way and she says no, there isn't anything, and one of the mathematicians, who is very statistically minded, she said, oh there is nothing for you..... so I wait for them to tell me. Why should I worry? "No feeling was given in this interview of the state of staff morale or level of innovativeness in this school.

The LEA

The impression given by this department is of a self-contained unit which has most contact with the neighbouring school's geography department. "Well, I see him (Mr Davies, that school's head of department) at least once every two

weeks. "Apart from this link the main outside contact is via the local GA where lectures for sixth formers are given but Mrs Rolfe is not entirely clued up about such activities since remarked, "We had Professor Cole,em Monica Cole, on sensory perception and all sorts of satellite photographs.....that sort of thing". (a clear misunderstanding of the lecture and a most unlikely session for Monica Cole to heads of department." She was rather scathing about the fieldtrip organised by the local adviser, "It was purely an old fashioned look-see, listen sort of thing. We don't want it you see" (They have their own fieldwork). She spoke of heads of department meetings held by a local adviser, "I'm trying to think what else we did (speaking of the last meeting).....it was a long meeting.....it went on 'till 6 o'clock(laughter).....there were a lot of things in it". (But she cannot remember any of them!) Meetings are held, "in the middle of nowhere. This is north (LEA 1). He has these meetings 2 or 3 times a year". (Overall impression is hat she doesn't have a lot of time for the work of the local adviser). Mrs Rolfe seems unaffected by any LEA policy to do with computers and is unaware of the role of the adviser for IT or the view of the Director of Education. She 'sends' members of the department to the LEA organised geography meetings, such as the one to do with computers. (a comment on a particular management style?) Contact with other teachers is limited to the regular meetings with the neighbouring head of Geography Mr Davies.

National Picture

Apart from attendance at the annual GA Conference, Mrs Rolfe seems unaffected by national level developments in IT and Geography. So for instance, she was unaware of MEP or the literature on IT. For instance no mention was made of the TG Computer Page or any of the considerable literature (even in 1983) to do with computers and geography.

School 1A 8/5/85

Since the last interview the young teacher who had expressed a certain interest in IT "hasn't initiated anything". "There is now one person in charge of computers who has no other responsibility". Some 'action' has occurred in geography, "partly because we got hold of the farm gameour deputy head (the geographer) has changed it, so it's very colourful....it's used in geography lessons but we have to book the computer room....I did buy the BBC programs for the sixth form.....it's got no drainage, industrial location.....".

The new head of computing was a biologist at the school and, "she's absolutely delighted that more of us use it..... she's keen for all of us to use them (the computers)). "Mrs Rolfe went to the GA Conference, "to see if I could look at the programs.... I wanted a weather program but I found them terribly disappointing.....WEATHER FORECASTING I found I kept making mistakes....it wasn't very specific....I'm a bit impressed that I was, but I think there are major problems in producing the sort of material I want to use in school. I think they make it too facile in terms of the sixth form..... I get the impression that things are still in the early stages and we need more people devising software for us". As to the head teacher and her views on IT....."I'm not aware of her being for or against in any way".

Again rather negative views come across to do with the local humanities adviser....."I don't think to be frank that I gain anything from the set up of an area adviser. They did quite a good sixth form one-day conference". Two CAL meetings were organised by the LEA. They as a department were not able to attend one, "because we were very busy "and the other because of industrial action. I would like to look at the software (held at the teacher's centre) but our computer studies person says they've practically no geography stuff". However, there is grudging admission of what the LEA lays on. "Well, probably, in fact, since Mr David came there's more done here than in any authority I've

been in. "I'm going back into the Ark....but I've taught in Birmingham, Warwickshire, Lancashire...." . Accepts that traditionally her "curriculum development and ideas have come from the GA". (Perhaps then has a limited view on the INSET role of the LEA in contrast to the GA).

As to disruption caused by industrial action and state of the staff's morale....."I think we've seen less disruption than many schools.....I think the morale of staff as a whole, all teaching staff, is pretty low..... a low opinion of the Secretary of State". No conscious management strategy is used (still) for running the department. "We do have meetings on an irregular basis....very often there are things I have to ask then....I would like to split things up more but to some extent it's a matter of whether other people are willing to do it.... the only thing I have divided is the filing cabinet...into sections and each member of staff is responsible for keeping any eye on a certain section".

A slight movement of views has occurred in relation to the future of IT and geography.... "I would like to see more software that could be used to test and teach either techniques or processes that need consolidation, that are difficult. Things like map work, cross sections, interpretations of contours, weather maps, even industrial location".

School 1A 30/6/89

Mrs Rolfe completed my questionnaire and described the changes since 1985. There is now a Nimbus Network throughout the school with a 12 station laboratory in the Sixth Form Block. A terminal to this network is in the Humanities 'area'. Only the head of department remains of the 1985 geography staff, The GCSE syllabus has changed to LEAG 'A' and the A level to the each year in the school". Those she listed were : FARM GAME and MAPPING for the first year; RICE GAME for the second year; a program to do with location of places for the third year; POPULATION for the fourth year; and various

programs " none successful' for the sixth form. These are in addition to the MESU pack of material given to every department in the LEA if a member was sent on a two and a half day course during 1989. Mrs Rolfe sent her junior colleague on that. As Mrs Rolfe related in her questionnaire , "I prefer them to be used in the computer room by the whole class working in pairs. One colleague makes a great deal of use of the individual computer in one of the geography rooms". She feels computers are, "Best for decision making and testing exercised... as with all teaching there should be a variety of teaching methods". The young colleague who attended the 1989 course laid on by the LEA perhaps is beginning to have an impact on Mrs Rolfe! As Erica Stoneman wrote in the evaluation of that INSET, "Yes....the course encouraged me to use it a lot". She used FRONT PAGE EXTRA with a first class and her 'partner' on the course came to observe the lesson. She remarked, "....very good..... the pupils found it exciting even though there were problems.....I have demonstrated the new programs (from the INSET pack) to the other members of the department, but they have not used them".

Post Script

Mrs Rolfe gives every indication of being a conservative influence on her department. She has predominantly a background in grammar schools and dress (twin-set and pearls), newspaper (The Times) and attitudes, all support this theory. She regards herself as a 'camp follower' to her husband and one wonders about her level of commitment to geography education. Her department is not especially popular with the children, judging from the numbers who opt for geography. The courses on offer are traditional, as illustrated by the A level syllabus they use, the Cambridge Board, generally regarded as one of the more conservative. She clearly made an early negative judgement on CAL and has not changed her mind subsequently. Indeed she seems to seek out evidence to support that conclusion. She consequently has

not made efforts to find out about the area and is rather ignorant of the literature and so on. She is of the view that statistical work is the forte of CAL and seems unaware of other possibilities.

There seems to be a rather hierarchical management structure here and her rather bossy self-assured manner displayed, fits in with this. A good illustration of that was given to me when I was being shown around the computer room. At the time a young teacher of English was in the room having certain difficulties, but unabashed Mrs Rolfe strode in saying "Oh, she won't not least to do with CAL. I felt an element of arrogance and complacency in this interviewee. Clearly there is no love lost for the local Humanities adviser.

Interestingly, on my return in 1985, there were some indications of a change of attitude and action, but they turned out to be more illusory than real. I wonder to what extent my earlier, if limited, contact had had an effect, since on telephoning to arrange the second interview, I was asked quite forcefully to lay on a course on CAL at the Institute to which she could go. (I declined and suggested other possibilities since I was wary of becoming too much of a 'participant observer'). She had bought some programs and had used a revised version of a Farm Game and had pointedly sent me a copy of the related worksheet. The new head of computers was very keen to see a range of subjects use the micro-lab but she did not seem to be a big influence on Mrs Rolfe and her department. A marginally more sophisticated view of CAL was expressed this interview, but I couldn't but notice that Mrs Rolfe became considerably more animated about her recent trip to the USA, than had been the case with our discussions on geography education. By 1989 more geography programs had been purchased and a Nimbus set-up around the school allied with a keen new geography teacher suggest that IT in geography education here may have turned a corner in this school!

Appendix 5.4 Portrait of School 1B

School 1B 25/11/83

Background

School 1B is the brother school to the adjoining school 1A, and is an 11-18 boys comprehensive with 1130 pupils. Its origins were as an old grammar school, which moved to this new site and buildings in 1969.

Interviewee

Mr Davies is the head of the geography department, has been at the school for 20 years and before that taught for 5 years in Birmingham. Although admitting to being a bit stale, he bellies that statement by showing considerable awareness of modern developments and a highly developed conscience about innovation in which he has not taken part. For instance, "...no this is one of the areas that bothers me actuallythat I have not changed in the course area sufficiently.....16-19 for example, although we know about it.....but we haven't done anything about it". and, ".....one so often is not able to go (to INSET courses) because of other commitments. You feel guilty because you didn't go yourself...." and in a written communication to myself, " I apologised for not having read your most recent publication on computing, but I forgot to say that I have had a copy of the GET/GA book Computer Assisted Learning in Geography since the GA conference in 1981 and found it quite interesting and useful as an introduction to thinking about CAL". "Well, I thought it (DEMOG) certainly had some value....again (guiltily) I haven't put it into use".

His awareness of developments in CAL is considerable and unusually long-standing. He seemed very knowledgeable about the computing set-up in the school, for instance, "Up to this year we have only had two 380Zs but we now have 7 or 8 480Zs and a couple of BBCs, but they are the model As now upgraded". In the past he has used the computer in his geography classroom",

....I brought the 380Z to my classroom (used the FARM program).....eventually the program worked by the second half of the double period". (It had not been a successful first use of the technology!) "It turned me off, and in any case the 380Z trolley arrangement now doesn't exist". He had bought some early programs such as SPITSYM and,".....one lad who was an A level geographer who had used it and sent it back as a part of his work in O level computing. He sent it up to Imperial (College) a couple of times to see how it worked. "(A form of batch-processing) Mr Davies was not impressed by this experience however. "It doesn't really appeal to me". Yet he continued his interest by purchasing more programs..... " I have got all the Schools Council Programs. I have tried DEMOG and FARM without a class. A colleague of mine used it (DEMOG) with a third and the sixth form....it was only a matter of one or two lessons and it would have been pre-1982 (when the 380Z trolley worked) (This colleague was the geography colleague who seem to have been a very early and important influence on Mr Davies).

"Well, my colleague Mr Elliott, who is now head of geography at Shepton Girls,.....he bought himself a BBC and has forged ahead. He was a colleague here until a year ago.....so he left in 1982. He used DEMOG quite successfully and I think he used FARM as well and GSTATS..... He has taken it a lot further. I think he has got a more mathematical mind which enables him to program a little better than me". Discussing FARM, "I liked the way it could show weather conditions for three different parts of the country, enables them to follow through how the weather affects the yield and of course it does all the calculations so rapidly, it allows you to compare over an eight year period. I have used it as a way of showing then the sort of thing that can be done by computing and the sort of things that might come in the future". "RAIL, TRADE and GSTATS, I am afraid I haven't yet tried,....oh no, now or two of my pupils have used it for their A level". This is a consistent story.....for several years he has encouraged the use by pupils especially sixth formers of software he has had little time to use himself. For instance when discussing the merits of

MORPH....."I feel it would be better to say to a lad experiment with this yourself because otherwise I don't think I can afford the time". His interest in computers is long-standing,....."I went on a course at Imperial College in May 1980 (in fact he later realised that it was in fact in 1978!). It was CEDAR Project. It was showing us how the computer could be used in geography and history.....one Saturday.....It was of interest because it did show us HURKLE and one or two of the other programs.....but it was impossible to get more than a cursory glance and minimal 'hands-on' experience, and without a computer at that time there was no point in getting them". "We had an in-service course (at school 1B) in the Spring Term 1981. run by the former head of maths, but this was really only a very basic introduction to BASIC. However, it did prompt me to get the complete geography package from the Schools Council, just after it was published". Asked about any other programs he had seen,. "Well, I have the Longmans catalogue here at the moment and one or two of them look as if they are interesting..... the other one we do have is CLIMATE. It was purchased by the Maths department and I hadn't realised they had it until this term". (Maths department is essentially the 'gatekeeper' for computing in the school). He agrees that he is the most knowledgeable about computing in the department, "Nobody else in the department knows about computing and programs. I have passed the book around so they all know about the Schools Council and nobody has tried using them". "He keeps remembering more programs that he has purchased....."Oh, I have just thoughtI have program which was published in the BBC micro magazine, called NOMSEA....nomadic herders in W.Africa, the Fulani". He also has purchased (for use at home) two programs, "which I feel are not good geography programs.....there's a multiple choice program for rivers, towns and highlands in Britain. I haven't used it with kids. "He gets them from a commercial firm....Program Power through his reading of the micro magazines"....and another one deals with capitals...."He was an early member of GAPE (Geographical Association Package Exchange) and (unusually in all my interviews) was aware of the existence of MEP....."All I

know is that is the education of teachers about micro". He has also given some thought to the possible futures for CAL. "So I feel my use of computing in geography has been extremely rudimentary, but as new and better programs become available there is a very definite place for them. "(This rather neatly illustrates his great modesty about his achievements in this and other areas of geography education).

"If you had a situation where you had a computer installed in a geography department that you could send students to nice and quietly during your lesson.....see what effect climate would have on farming in Britain and they would run the program and they would come out and say.....well we have discovered that when it was very wet we get a lot of grass and so on". When asked about the sort of software that could be developed he replied. " I think the HUNTING the HURKLE type thing, co-ordinates, I think that makes quite a good little program. I think things.....straightforward things like knowledge of capitals, rivers, hills and so on can be reinforced because you have the visual and the competition aspect in a game type situation.....certainly the statistics areas where you have got gravity models and that sort of thing, number crunching certainly and I think there is probably an extension as far as graphics is concerned". ".....but I do see them having a very important place both used on their own and linked up to external data banks". In spite of certain doubts and less than happy experiences with micros, Mr Davies is still active and keen in this area. He is doing an evening class at his own school on compute programming. Also at home he has a BBC A micro which he has upgraded. His children use the geography programs he has purchased through the BBC micro users magazine. Mr Davies's professionalism is illustrated by a written follow up to this interview dated 27 November 1993, in which he expands on various points covered in the interview. " I hope this will add a little more to my taped comments, I felt so very 'nervous' on Friday. Again apologies. "A further comment on his commitment is indicated by having discovered an error in the

farm game. "I asked David Walker himself, about the problem, when I saw him at one of the GA Conference computer workshops in 1981".

When asked specifically about his attitudes to various statements put to him, he was quite cautious and to an extent contradictory. For instance, he agreed that there are 'too many problems involved in using computers in geography teaching' and that at the "moment" 'there is limited educational value in using CAL for geography classroom of the 1980s,' and disagreed that 'The main value of microcomputers is to perform statistical analysis of geographical data'.

Geography Department

Geography is strong and has a considerable tradition in this school. There are three full-time members of staff (all in their first few years of teaching but all apparently with degrees in geography and one with an MSc from Birkbeck College), in addition to Mr Davies, and others who take some lower school lessons. Three A level sets are shared with the adjoining girls school but the majority are from the boys school. "Usually around 25 A level youngsters a year.....again much bigger than the girls school (they get about 12 per year).....so sets have been 30-40." Asked about the strength of the department, ".....I can't understand why but we have always had a tradition of large geography classes. We do rather better (140 candidates at GCSE level) than history or business studies against which we are blocked.....It isn't the rooms, it must be the people. We have always worked together....." All these comments are further evidence of his self-effacing manner, since a good deal of this popularity must be attributed to his influence given his length of tenure here (20). "It is a matter of people choosing to do the subject. We allow them in even if they have only grade D at 'O' level..... mind you it is not that surprising that we get a fairly long tail in our A level results. " A conscious policy of his seems to be to encourage young members of staff to move on to heads of department positions and this has happened a good deal., Clearly

one management strategy adopted (though I am not sure whether conscious or not) has been to give freedom to these young teachers to innovate, yet at the same time be fulsome in praise and encouragement. In spite of 20 years in the same post he still displays interest and awareness of new developments though admitted to felling at times a little 'browned off'. This obvious need for a 'breathing space' was satisfied in 1984/s by his LEA supporting him full-time to attend the MA Geography in Education course at the Institute of Education. This was partly made possible by his energy in pursuing the secondment arrangements with the Authority.

Various constraints and limitations were made clear in the interview. When asked how much micros were used in the department, "Very difficult to use the micros since much of the week is timetabled out (i.e. the computer room). Often pupils are in the rooms for maths lessons and whether or not they use the computers I wouldn't know. It is a maths classroom converted." (He seems to be doubting whether the micros are used all the time) He clearly had a negative first experience with the 380Z in his classroom since the FARM program wouldn't load. "Eventually the program worked by the second half of the double period it turned me off, and in any case the 380Z trolley now doesn't exist. "Mr Davies identified, number of programs , appropriateness of programs, getting the machines at the right time and place" as the main constraints. "The other problem is that we cannot use 380Z programs on the BBC and few have yet appeared for the latter". A lot more familiarisation is required by staff". "I found one of the biggest problems in trying to become 'computer literate' is the great amount o time needed and I have perhaps not given it enough time".

He tried to interest the other members of the department in CAL but unsuccessfully, "Nobody else in the department knows about computing and programs. I have passed the book around so they all know about the Schools Council and nobody has tried using them. "However his earlier colleague Mr

Elliott who left in 1982 had a clear influence on Mr Davies, possibly by encouraging him to initially 'have a go'. However relative to other geography departments in 1983, school 1B does make quite a bit of use of the micro. DEMOG 1 and 2 are used with third years; FARM with second years; MORPH with the lower sixth for work on rivers; and GSTATS used occasionally by individual sixth formers for their project work.

The School

In the early nineteen eighties, "The maths department got the 380Z about 2/3 years ago as part of their normal work since the previous head of department was one of the leading lights of the Borough..... so we had quite an early lead. In the early days he was doing computing on the 1C (Imperial College) main frame..... batch processing in the late 1970s". "The person in charge of computers now, again, comes from the maths department and teaches both computers and maths. There are computer courses now in the first and second year..... computer literacy/awareness". No mention was made in this interview with Mr Davies about the Head's or the IT co-ordinators views, roles or influence on him or his department. No school IT policy was mentioned and no comment was passed about the state of morale of the staff and/or their responsiveness to innovation. "We have been lucky but they are having to lose four at School 1F". (This refers to a local school where they are having to lose four staff).

The LEA

The attitude to the relatively new Humanities adviser was positive and in marked contrast to the negative views of Mrs Rolfe. "Mr David who has only been here 18 months or so is organising these (Sixth form conferences)... run differently to the way they were run before..... many of us didn't get on quite so

well with the previous post holder..... he has been very good as our new inspector..... and there have been several useful meetings organised by him". In this interview there was no mention of any direct contact with the local IT adviser, or any awareness of the stance of the Director of Education or any LEA policy towards computing. However there was an early course laid on by the LEA which he (and several others!) mentioned. "This was an in-service course at the Teachers Centre in October 1982, but Paul Gomer (Mr Davies gets the name confused with Neil Pope since Paul Gomer was the advisory teacher with responsibility for IT in the LEA but was not the leader of this meeting. It is a comment on how rarely Mr Davies and others get to see and know other teachers. If anyone would have remembered the names of those attending the meeting it would have been Mr Davies since he proved to be highly meticulous in his recall of such events) from School 1C, I think, was unable to show us much because the programs would not load and some he should have had were not available....it was one of the worst..... a complete waste of time, and might have turned several against the computer! However, we are told that when the Teachers Centre moves to its new home next year things will improve and computer programs will be available for us to try out". (Mr Davies is still positively inclined in spite of that bad experience!)

Mr Davies has limited contact with other geography teachers in the borough at this stage apart from his regular meetings with Mrs Rolfe since they share sixth form teaching. They cooperate but they are clearly very different people. He seems to feel (probably justifiably!) that she is a little conservative and not as ago ahead as himself. However he is highly circumspect about making direct criticism of her. This interpretation is based on subtle nuances in our conversation.

National Picture

Mr Davies is aware of the MEP's existence though not of its substance and has kept up with CAL Geography developments through attendance at annual GA conference and computer workshops and through early membership of GAPE (an organisation supported by the GA to help teachers use microcomputers.) There was also the 1978 course he attended at Imperial College. In a subsequent letter to me, Mr Davies commented (as quoted earlier) about his reading, "but I forgot to say that I have had a copy of the CET/GA book Computer Assisted Learning in Geography since the GA Conference 1981 and found it quite interesting and useful as an introduction to thinking about CAL".

School 1B 3/5/85

Eighteen months have elapsed since my last interview with Mr Davies. He is now on the full-time MA Geography in Education course at the Institute of Education, and I am the tutor for his dissertation which is about the nature of geography software. Rolls are beginning to fall at the school and two and a half members of staff were lost last year and again will be lost this year, though the staffing of the geography department has been unaffected not least because its popularity has held up. For instance, they are expecting 40 students to take A level geography next year. One of the junior members of the department has taken over from Mr Davies for the next year and "They seem to be continuing very well. Certainly, Tom doesn't seem to have had any problems and all seems to be going well". This is probably a comment on how the department has been run in the past whereby it has been a team exercise and this has continued. A major development at School 1B has been the acquisition of a 10 station 480Z network. The problem is that these extra micros are housed in a small maths room alongside some upgrade BBC As. This has meant that access to such micros has not improved for departments outside of maths. (Perhaps also it is a comment on the Head's unwillingness to release a much needed room for another bank of computers. Is it therefore low on his

priorities?) A younger member of the maths department has taken over the responsibility for computers. Mr Davies was unable at the time of the interview to tell me what the policy stance of this man was, though he does seem to have been instrumental in setting up a sort of General Studies/IT course which he wishes Mr Davies to teach on. It seems that this new post holder is more than willing to help members of staff outside of maths and computing to use IT but does not make the first move to encourage that. "He doesn't strike me as the evangelising type, but I know he will accord facilities to whichever department is interested". So for instance although his predecessor had bought a copy of CLIMATE he did not inform Mr Davies about its existence and it was purely by chance that Mr Davies came across it.

Similarly there is no clear drive or policy from the headteacher on IT. However since 1984 one period a week was introduced for 'computer studies' for the first three years of the school and this has now been reduced to one per fortnight. "The head has also given public expectation as a reason for computer work in the lower school.... parents would probably expect a continuation (after the primary schools) in the secondary school". However there is the beginning of a view from the head that IT across the curriculum is the future and so the school does not offer 'A' level in Computer Studies because we do not consider it an essential A level as many employers would rather have a good A level maths candidate whom they would train in computer work". The local Borough newspaper quoted the Head on 9/5/85 as saying, "We regard ourselves as being in the forefront in computing developments....." However, Mr Davies's view so that the head does believe the school is "reasonably well versed in computer but feels that an early lead we had when using the batch processing at Imperial College has perhaps not been maintained.... but constraints on money and staffing can be pinpointed as reasons computing in School 1B has simply grown as an appendage of the maths department". "The Deputy Head is concerned at the piecemeal development of computing". Clearly no overall plan or vision comes across in this interview. Indeed an element of

confusion exists, for instance the "administration is supposed to be being computerised but no clear plans have been given none of them seem to know what is being installed or when..... the Head's big difficulty.....how much time, money, staffing should he allocate towards CAL?". Clearly he has no coherent vision or policy at present and his task is made more difficult by the imminent loss of the present head of computer studies, one of the junior mathematicians..... going to a scale 3 in Leek, Staffs".

Mr Davies then spoke of the impact the MA course was having on him. "Its done a great deal, because it has taken me out of what you might say an unfortunate rut.... and its given me a great deal of spiritual refreshment, it has given me a great deal of additional overview of the subjects and the philosophy of the subject. it really opened many doors, in terms of personal development, in terms of going places, meeting people and getting down to looking at the overall question of the CAL side of things, which I have as my particular interest. I do value greatly the way in which it has opened up doors and got me out in various directions". The other members of his department still seem remote from these CAL developments though his acting deputy has said, "Well, I've no idea about it yet..... I really would like to it down and learn some but I haven't got the time". Mr Davies has some clear ideas as to what he would like to do with CAL in his department when he returns. "What I'm going to try and see is whether I can divert away from the computer room one of the BBC machines and a disc drive, hopefully.....certainly I feel that I would like to buy the A level BBC programs..... the INTRODUCING GEOGRAPHY programs..... the NELCAL programs for a start. The MAPSKILLS one I think would be quite useful". His views have been confirmed by the MA course in that, "I feel that there is a very important place for it in future use, because from what I have observed in the classrooms that I have visited so far.....it seems to me to generate a very, very much greater interest in the overall topic". (for pupils). "I would like to think that you could get one machine easily accessible in the classroom, so that it can be there to be part of everyday.....so that where

programs are available you can use it as a matter of course. If you come up against a problem with , for example, map skills you could say to the pupils you need a little bit more practice or you need to try and understand it and you say to them 'go and have ten minutes on the computer'. And I think in that way, the real learning will be reinforced using the computer". "Certainly when you look at a suite of programs like the FIELDWORK programs (MEP) they are very, very valuable. I say very valuable I can see myself using them.....".

He was then asked about remaining constraints on the development of CAL in geography. "I think financial is one very important consideration. Secondly, there are the actual limitations within a particular school, with regard to the availability of the facility. I think that situation is highly individualistic, because in one school although it's very separate, it may be easy to arrange..... in another school it may be across the other side of the campus and it just becomes too much hassle to rearrange your class.....I see the future development really in individual geography departments having sufficiently keen members to go out and argue with the Head for one of the cast-off BBC ones from earlier usage". Asked about his LEA policy to support geography teachers to use CAL, "They have initiated a meeting by suggesting that teachers could meet together and start to evaluate". He recalls again the disastrous meeting in 1982 which, "Certainly put off a large number of the you might say wavers. I don't think they would have bothered then. "There was a second meeting organised which was almost as disastrous, "The problem has been the Borough post.....it's a ridiculous thing to say, but it failed to come to anything very much, because virtually all the schools failed to get a reminder about the day or failed to get the date in the first place or something like that. And therefore it just came down to six of us..... The other problem was, in fact,..... the Union action as well which has not helped in case this year. I know for example Saul Jacobs (an early and influential user of CAL in the Borough) didn't go for that reason. So it's a combination of things". His views on LEA support are still positive. "As far as the computing is concerned, probably reasonably, it's further ahead than many

(other LEA's) I think it certainly does try to encourage its staff and since Mr David has been in charge, we've had quite an encouraging situation". He bemoans the isolation of teachers, "Yes, we are isolated within a school and however many meetings are proposed you cannot drag all the people concerned to every meeting, many of them not being able to get there for perfectly good reasons..... so therefore we tend to work in isolation and you find one school does develop in one particular direction, another school doesn't". The potential curriculum development link between Mr Davies and his near neighbour Mrs Rolfe is clearly frustrated by the latter's style which is so different to that of Mr Davies. He refuses to be drawn into criticism of his colleague but mentions that his wife reckons his comment about Mrs Rolfe are tinged with not a little venom! However, he does see the LEA idea of getting teachers together to evaluate software as a major way forward.

School 1B 13/7/89

Mr Davies completed my questionnaire and returned it with an enclosed letter. Since returning to the school after the MA course he has been made Head of Lower Sixth and thereby has considerably more pastoral responsibilities. He handed over responsibility for geography to a junior member of the department in September 1988. It is not surprising that he reports, "I'm sorry to say that progress seems very slow. I have hardly used the computer this year and in spite of having Martin Moseley's MESU Pack, time to develop its use has been at a premium. Now time has run out! I am retiring at the end of this term!". (Because of family illness and his wife now needing his help in running two village shops in rural Kent) He sadly reports that his efforts to interest his colleagues in CAL have proved fruitless so, "There is no point in sending to anyone else in the geography department here because they are not interested!". (He is referring to details of CAL Geography Research Seminars held at the Institute which Mr Davies used to attend since undertaking the MA.)

On behalf of the LEA he attended a course on the use of the Domesday System (Interactive Video) and in return the LEA gave the school an entire (and expensive) system. "I have suggested to the Head that it should be installed in our new IT room, which he is setting up as his swan-song he is retiring at Christmas".

In his questionnaire response, Mr Davies points out that geography is as popular as ever with four sets at GCSE level this year. At last a BBC b stand alone micro has been acquired for use by geography, history and languages and is used mainly by him. "Now this week a new network of Nimbus machines has been installed in the library, " (to be the new IT room) Since 1985 Mr Davies has acquired a good deal of extra software. These include; SEACLIFF EROSION, POPULATION GROWTH, GRIDS and MAPS; MEP/GAPE programs; Geography Pack published by MESU; GRASS database; FARM RESOURCES GAME, MICRO-MAPPING and DEVELOPMENT DATA SEARCH. The software he has particularly used has been POPULATION GROWTH and SEA CLIFF EROSION. He continues to see a variety of ways in which computers can be used in geography, including, "passing on information on a multitude of topics; explaining processes; analysis of data; using spreadsheets; using word processing and databases". He continues to be disappointed that only one other colleagues has begun to use a computer even though he ran, "A one day course at the school in the summer of 1988... other colleagues more concerned with covering syllabus in traditional ways.... not prepared to 'waste time ' problems with getting other colleagues interested let alone use effectively..... progress is still very slow..... our Borough course with Martin Moseley showed that most of us there were experiencing difficulties in getting the equipment to use i.e. network availability. Stand alone use is difficult with large classes".

Mr Davies took part in the innovative LEA organised two and a half day course over February and July 1989 in which the participants were encouraged to

observe a colleague (and verse-versa) make use of the micro as a result of the INSET. The partner for Mr Davies was Martin Moseley, the two being probably the most experienced CAL users on the course.

Post Script

Here we have a self-effacing and aware head of department who has been cogniscent of CAL geography developments since 1978. He leads a strong department but at no time over a 12 year period has he been able to interest any of his staff in CAL. His considerable early interest was maintained by the purchase of his own micro for home and his later participation in the 1984/5 MA course at the Institute of Education. Throughout ten years or so he has been realistic about the constraints facing CAL in geography and has faced his own share of difficulties in adopting this innovation. Yet these have not prevented him from having a vision of the future possibilities for IT in geography which developed as he became more sophisticated. He has fully supported and taken part in LEA initiatives including meetings of which, at times, he has been rightly critical. School 1B has lacked clear direction and support for IT across the curriculum and through a continuing commitment to computer studies and awareness (rather than to IT across the curriculum) has erected more barriers than encouragement to people like Mr Davies. This seems true of both the Head and the people in charge of computer studies. The latter have both been maths teachers without 'IT across the curriculum' training. Sadly for the development of such a policy in this school, Mr Davies was about to retire just as more geography software had been purchased, a Nimbus laboratory set-up and a Domesday System acquired. All his residue of experience and talent for geography education and its potential use in bringing about IT into geography and across the curriculum is now lost!

Appendix 5.5 Portrait of School 1C

School 1C 20/12/83

Background

School C is a group 10, 11-18 voluntary aided (Catholic) mixed comprehensive school

Interviewee

Neil Pope is one of the two deputy heads at this school, and used to be head of geography. To my knowledge, he was one the very earliest teachers to use computers in his geography lessons and one of the earliest teachers to engage in action research involving CAL Geography. His MA dissertation, 1978, (for the MA Geography in Education degree at the Institute of Education) was entitled, 'The computer in the classroom-computer assisted learning in geography at the secondary school level'. It evaluated the use of a particular program in a geography classroom and compared its success with more usual teaching strategies..... the forerunner of many similar pieces of research. He had also worked with a group of teachers, supported by the Computers in the Curriculum Project, to develop a set of four A level geography programs which were published by Longman as early as 1983. He was asked to be the joint editor of these programs and their associated teachers notes.

Although no longer head of geography, he still teaches a quarter of a timetable in geography and clearly is an influence on the department. He is totally cogniscent of the computing set-up in the school and has been a key influence on IT policy (such as it is!) given his interest in computers and his position in the school. His sophistication to do with computers is considerable. For instance, he was able to convert some geography programs from cassette to disc and

pays for his own copy of Educational Computing. Also he has joined the LEA 'computer group' which consists of mainly computer studies people but also teachers from other subject areas, such as himself. He feels that geography in the Borough is more active in the CAL area than any other subject apart from computer studies. (Is this accurate I wonder or is it a comment on his own interest?) Similarly he has a perhaps, over-optimistic view of the computer awareness of present day geography undergraduates. "..... and of course now computers are at least part of their training. ..."it's very rare that in geography they won't have had some access to it. He is fully aware of the work of MEP and its objectives and regional structure. "I'm disappointed in the MEP, which should have become South London Capital thing.... but it hasn't stimulated where I would like to see it, it hasn't stimulated inside the school or within the Borough it's still too remote people don't know what MEP is". He feels the development of CAL has been too reliant on the goodwill of already stretched people. "Nationally, like anything in Britain, we have a bunch of dedicated people giving up their spare time to do the work in CAL. We don't have that many full-time people..... you have people willing to give up their time". When asked to respond to certain statements concerning CAL and geography, he is both informed and optimistic. When asked to react to the statement, 'Geography programs do not suit present geography courses'. he replied, "I would strongly disagree on that, because most programs are written by geographers". He recognises that many of his views would not be shared by other geographers, so when asked about the statement, 'The main value of microcomputers is to perform statistical analysis of geographical data', he responds, "I would disagree, I don't know about other people, but I would strongly disagree on that because there is a variety on that". Generally his views are optimistic but when asked about the statement, 'CAL should transform the geography classroom of the 1980's', "No I strongly disagree. The teachers will transform it". On the statement, 'CAL can help to motivate pupils in geography lesson' he retorts, "Getting less and less, as they've all got

computers. Originally, it was a wonderful thing and they didn't used to speak to you in case it heard it".

He has some interesting views on the future. "I still think it's going to hinge on when the geography departments buy their own micro, that's when the takeoff is going to be, when they can afford that.....it's coming into the realms of possibilities that geography departments will buy that. Now once you've got that in the department the geographers are going to use it probably more....."

He feels one major way forward is to link the home with the school computer markets. "...When over half have got computers in some way (at home) then educational publishers are going to put into it, and are going to do it in a big way..... I can see there is hope through the home computer market for a lot of the school work. The great problem is hat unless you standardise at home like you do at school....." He sees a key link between commercial publishers, hardware producers, the home market more then anything else and then the links with the education system. He extends his vision, ".....will take away a listing, put it onto theirs and run it at home and come back and tell me, 'when I did this Sir', and 'when I changed that'..... so they've gone and they've actually varied their homework". He also has the vision of children having data they can take home on discs leading" to the disappearance of libraries by the year 2000....." He has given thought to these possibilities, unusual for geography teachers as early as 1983.

Geography Department

There are three full timers in the department as well as someone who is partly a geography teacher and partly a history teacher. Two deputy heads, including Neil Pope, also teach some geography. The subject has become more popular over the last five years...." if we took fourth year options, it was something like two thirds/one third history/geography, and now it's reversed'. The GYSL GCSE course has helped boost its popularity, " and the children found it

interesting. So expanding'. About 123 out of a year group of 180 opt for geography in the fourth year.

The school has a considerable number of micros (for 1983!) Neil Pope has a 56K 380Z on long term loan to him from the Computers in the Curriculum Project, for whom he is editing some software and writing a teachers guide. There are two 380Zs, one PET, two ZX81s, one ZX80, and early BBC and a 480Z for careers and geography. "There is a computer room where, for security reasons, they are put away at night". (into an adjoining, small but secure room) Micros can be taken to a geography room when required. (Neil does this) They run a series of very popular computer clubs, "which the children are very interested in".

Neil is the only geographer who has made any amount of use of the computer in class. He uses DEMOG with third year children; FARM and MILL with first year children; ROUTE with fifth year children; and WINDS with both the first and sixth form. He has purchased, but hopes to use soon, MALTHUS, URBAN GROWTH and PUDDLE. He wishes to buy WEATHER. "Despite all our (his!) efforts with running workshops, there's no other part of the department that uses it....". In fact the careers teacher who also teaches some geography does use the micro for geography occasionally but Neil Pope is scathing about his motives and the educational value. "... he would throw anything on and use the computer like an old film strip projector, without being discerning or doing any of the preliminary work or any of the follow up. It occupies him.... he's a nice person, but the educational benefits are doubtful. If he wanted to do FARM and FARM wasn't available he would do VAPOUR. He doesn't want to disappoint them'. Also the head of department is a little interested. "A lot of people think that they've got to use it computers are the in-thing.... they've got used to it". "The other two are interested and they have had their initiation in the use of FARM, where everything went wrong.....of course. So now I've got to get

them over their teaching troubles again and say 'it doesn't work'. But one says, 'you never show any films, so why should I look at the computer'. It will come eventually. They are a bit disappointed with the software". So at the moment the main users of micros in the school are computer studies, the careers teacher and Neil Pope. Access seems to be the key constraints in this school at present. However this could be a perceived problem of access since he does not find it a problem at all. "In one way it's very good, because we're the only two (Careers teachers and himself) that use it, so at the moment, in a 40 period week, there's something like 20 computer studies periods. At any other slots you can just say, 'can I have the computer'..... so that's no problem until computer studies extends up and down the school and other subjects become interested". But others clearly have a different perspective. "Where you have instant access to it, it's going to be used more. But all the hassle of changing the rooms....if you're not sure about going to load it up, I mean look at that mass of cables that has to be fixed up, and if something goes wrong....." "Yes, plus they're still afraid of it not working in the classroom". No mention was made in this interview of any departmental policy to do with computers.

The School

The person with responsibility for computers in the school is a Miss Bluebell. This position "was originally housed under maths and computing, but I persuaded the Headmaster that it is across the curriculum and across the school, so computer studies is its own separate department....." Neil seems unhappy with the arrangement since there seems to be little progress in bringing about CAL across the curriculum, "Despite all our efforts with running workshops....." There have established a computer awareness course in each of the fourth and fifth years in the school. Neil, in fact, was instrumental in establishing this four years ago and it is now taught ' by computer studies

people'. In the interview no mention was made of the role of the Head nor the existence of any formal IT policy for the school.

The LEA

The recently established computer studies group was mentioned (of which Neil is a member). He also briefly mentioned the rather disastrous 1982 meeting at the Teachers Centre of which he as a major part! He did say however, "This must have been about 15 months ago. There hasn't been a take-up since that.....I remember when Mr David first came, and the first lot of MEP packs arrived, I was then asked to demonstrate it to people.... and I was assured that it all had high resolution graphics and various things and it didn't..... and it would only do 32K". Otherwise no further mention was made of the role of Mr David. He feels Paul Gomer, the advisory teacher, is less interested in CAL across the curriculum. "He is a computer Studies person". However, "I must say that Borough 1 is probably one of the most progressive for a smaller Borough.... there's a lot wrong with it in other things". No Borough policy or role of the Director of Education was touched on in this interview.

National Picture

As mentioned earlier MEP and its weaknesses was mentioned by Neil Pope and there have been wider influences on his knowledge through his work with the Computers in the Curriculum Project and his reading and activities to do with the MA research. These wider influences have failed to touch other members of staff in the school.

School 1C 19/3/85

Since our last meeting in 1983 the geography department has in strength. For instance, "...it was something like 60/40 in favour of history; it has now gone to something like 65/35 or even 70/30 in favour of geography". The numbers

taking A level have also increased from 3 in the lower sixth in 1983 to 15 now. The school, because of Borough policy, now has a computer network. "We have an 8 station network, 480Z, so that has obviously helped the situation. I'm in the process of transferring, from five and a quarter inch discs to eight inch discs, the geography programs so that we can use them as a network station". Neil has maintained his interest in computers by using them a great deal for his administration. He has modified a piece of software developed by a school though this initiative seems rather frowned upon by the LEA which wants schools to use their system! He feels that as a school they are a little neglected and under-resourced ever "since we defeated the Education Chairman over school transport.... we are out on a limb geographically and out of favour ever since....She has said to other people, 'that school will now go to the bottom of the list' and although it's very difficult to prove....."

Asked about the apparently progressive developments in administrative computing for schools in the Borough, "Well (LEA 1) has always been at the forefront of computers and it runs a very big computer gathering and there's a computer education committee and various other things.... its always been at the forefront". Apparently a former inspector has had a critical role in these developments over the years. "The Deputy Director of Education at the moment used to be the former Science and Maths Inspector..... was a very forceful character and he pushed it so that, at the early stages, it got off the ground.....and he, once again off the record, you either are for him or against him". He is apparently both an influential man and not a man to cross! "Oh yes, very dangerous. He will favour some people and put money into what he wants to and that's how its developed".

The same lady is responsible for computer studies in school 1C and "She's running a course for familiarisation for teachers..... for those who want to use it, she talks, she gives the software material to head of departments, she encourages them to use it, but none of them have.... it's not used in maths

which is surprising or even science". Geography and computer studies are the only users of the network in spite of these efforts. "But even within geography I am the only one that will use it". The computer studies lady, "Sees her brief really, as a computer studies person, who has been given, by the Borough this network for computers across the curriculum..... but she will not go out of her way to drag people in, quite naturally, but the facility is available".

When asked about the Head's role in all this, "He doesn't understand it.... he's the first to admit he doesn't understand (He leaves it to Neil Pope)..... He likes to talk about it and he will tell people we have an 8-station network, hoping that nobody will ask him what it is!"

Neil worries that all his efforts over the years to encourage staff to make use of CAL have still not been successful. "I have still not convinced people, like the scientists or other people, that in regard to simulations you can do wonderful things which are realistic and you can process material which you couldn't do by hand... like everything they are afraid..... we have more experts among the children, far more experts.... the computer literate, they know what will go wrong and what to do". "I think we sometimes put them off by saying, ' you've got to know the program inside out before you use it in the classroom'...in many cases it puts people off if it's got to be that good". (Implying unrealistically high expectations of the software) He continues with his thoughts about the constraints reducing the take-up of CAL"... and it's time that's having to be spent finding out....whereas before, in the good old days, you had 2 programs.... you use either program A or program B..... now picking up a computer catalogue with 48 different titles.....how do you do it.....all that puts people off.... so it's not like a book you can read and say, 'yes, fine". He feels that the use of computers should be written into examination syllabuses, "Why not put in now, why not become standard from now, that are relevant and we have specific programs written for example, for 14-16....." He feels strongly that access to and availability of the hardware is no longer a constraint in his

school, "so there's no problem with that, that has all gone. It's encouraging people to find it more useful or, which we still haven't done, is to say, it's essential, "He further wonders if the 'mature' hands of department in his school could be blockage to change, though that is not true of the head of geography who is relatively young. He uses the video a great deal but has not seriously into CAL. Neil Pope feels strongly that a firmer directive needs to come from the LEA inspectorate. "It's for them to enforce it..... there's nothing better than an inspector coming and saying, 'why haven't you used it, why isn't it here, do you want us to remove it?' (the computer) He feels it needs a slightly heavier hand from the LEA.

A within-school strategy he has begun to try, "what I'm working on is to get the enthusiasm of the children, once they've used this, to tell the other children. I took two first year classes and did it with them and she (a colleague) came back and said, my God, my class are pestering me, why can't we use a computer?' and so we showed it to her for them. "Still, at times he clearly despairs at the lack of success with his colleagues. ..."I do encourage people to attend (LEA courses laid on) We've had enough.....we've had five years of encouraging people.....if we haven't got it right now, there's something wrong. "It's as if he has given to trying. I asked him about the impact of MEP on his school. "I think MEP has done well. I think they've achieved their object of getting hardware into schools. "On the other hand the courses they run are problematic, he reckons. The three centres of Kingston, Croydon and Kennington cater for different types of courses. "....if you live in Bexley and you want to do geography you've got to travel to Kingston.....if you want to do IT you do it at Croydon.....The second fact is, all the courses are during the day, there's no supply cover. However much you want to do it, you can release them.... It's still remote. You get a booklet and that's it. "In his present role, with responsibility for staff development, he has noticed a big demand for computer courses. "And I would say that of all the courses that people want to do something in it's

computers. The demand is still there, but it's getting there". (Cost and supply cover).

Another interesting reflection on the difficulties of bringing about change is the blockage in promotions. "I'll tell you why, in one case, and that is job opportunities have disappeared. It's very difficult to move on and people are weighing up the benefit, because the likely benefit is doubtful anyway".

He was directly critical of Paul Gomer and his lack of encouragement of CAL across the curriculum....." "he is doing very little computers at the moment.....he is pursuing technology.....in CAL he has had very little impact. "He sees that Gomer has had a big priority in determining hardware policy. "You invite him, rather than he comes in. He has a basic disagreement of philosophy with me, as regards CAL. He thinks I'm playing around by showing these geography programs.....he is a computer man first". When asked about the Humanities Inspector Mr David, "...he asked me to help out on the computer software, we ran an afternoon for it (the unhappy meeting!) since then I've had no contact whatsoever.....Inspectors, 50% of their time is spent on redundancy and redeployment...." He also was peeved that Mr David had not been into the school to see their three probationers for whom he is also responsible. "I have not seen him yet... I do resent that". Probationary teachers are one of Neil Pope's responsibilities now.

Post Script

No response was received from school 1C when the questionnaire was sent out in 1989 and I have subsequently heard that Neil Pope has in the meantime gained a Headship in another Borough.

He has had an unequalled early interest and involvement in CAL geography though by 1985 this had begun to wane given the different priorities of his Deputy Headship position. The school was, in the early days, well-off for

hardware and this was maintained over the years. What has been notable by its absence, has been the 'lack of action' in IT across the curriculum in this school. Only computer studies and geography had made any amount of use of the technology by 1985. Geography too was well-off for software right from the late 1970s through the interest of Neil Pope. He has displayed increasing disappointment with his colleagues over the years given their lack of activity in using computers in geography classrooms and this in spite of his efforts. One sensed that by 1985 he had given up in that direction! Throughout Neil Pope has had some original and thoughtful views on the possible futures for IT in geography. He spotlighted the influential role of the present Deputy Director of Education in making LEA 1 such a leader in the field of computer education.

Appendix 5.6 Portrait of School 1D

School 1D 21/2/84

Background

School 1D is a boys 11-18 comprehensive with 1180 pupils sharing a separate sixth form unit with the adjoining girls school. According to Tony Lichfield, my interviewee, "In the eyes of the local area. It's probably the most successful comprehensive this side of the Borough". (Apart from what are known as the two 'super-selective' in the LEA.) So, they are an oversubscribed school with an above average share of ore able children.

Interviewee

Tony Lichfield has been at the school for 19 years, was head of geography until 9 years ago and is now 'Senior Housemaster'. At present he is on the full-time MA Geography in Education course at the Institute of Education, where his dissertation concerns fieldwork. His colleague, Ken Box, successfully undertook the same course in 1980 and his dissertation concerned Urban Trails. Ken is now head of humanities and responsible for geography.

Tony seems aware of what hardware is around the school though for the details including precise locations, he wrote to me subsequent to the interview, having consulted with the head of computer studies. He is also aware that there is now a 380Z micro in the geography department but doesn't know why it ended up there. "How it come about, I don't know, because it just appeared (May, 1983) suddenly in the geography store-room where most of the worksheets are prepared. (In spite of his absence on the MA course one wonders about Tony's current centrality within the geography department.) Tony only seems to know about one geography program, "I say one, Alice had it for Remedial, it was a very simplified version of the Railway Game..... it was a program, animated program, about building railways..... it was American. It seemed like a very, very simplified version of Rex Walford's game....."To is knowledge no

geography class has used the computer in spite of the existence of the 380Z, which appears to just sit in a store-cupboard! Tony Lichfield was then asked to respond to certain statements about CAL in geography. Overall his attitudes were conservative and not well-informed. For instance, he agreed with the statement, 'There are too many problems involved in using computers in geography teaching'. He felt unable to comment on the quality of geography programs since he had seen so few of them. Though he agrees that, 'Geography teachers along with other teachers should help to develop computerate pupils' he agreed that, 'There is little help or information available about using the computer in geography teaching'....."I think I would agree with that..... there's enough about computers, but not a lot tied into geography". He also agrees that, 'there is too much teacher-time involved in the learning of CAL for geography teaching'. He also feels that the main use of computers in geography is to perform statistical analysis of geographical data.

In general terms (though he would say this wouldn't he?) he feels that geography has slopped in the school over the last few years. "It's just the fact that, as I see it,....geography has been very much eclipsedit doesn't stand anywhere near as high as it used to, not in status. I think this has partly been a deliberate policy on behalf of the Headmaster.....he was a scientist, he came in determined to build up the science. A lot of money went into science, particularly computer education. Also he built up the technology side. Meanwhile the side which tended to get the chop was humanities, arts..... that sort of thing. "Also, although he admires several elements of the humanities course for the first two years in the school, not least its level of organisation, he feels geography has suffered. "My own feeling is that the historical side tends to push out the geographical side.....we haven't got enough of the basic elements of geography".

Geography Department

There are three full-time geographers in the department alongside one other who teaches some geography as well as sociology and history. It is a popular subject attracting over 100 out of a year group of 180 into the fourth year. (At this time for 'O' level or CSE) and eight go on to 'A' level. "Of the humanities subjects, it is the subject still..... we have a far greater number". (Than history) "I would say the main thing where we shine forth is in this first and second year humanities course". They have regular departmental meetings once a month but more often meetings concerning particular courses such as the humanities courses.

There is no activity in the department using computers and no mention of constraints acting upon them. No software has been purchased and the level of knowledge about CAL is low. A considerable number of micros are spread about the school. In particular there is an early network of 480Zs in one room and two 380Zs, two PETs and two Sorcerers scattered elsewhere. A small computer laboratory was established three years ago and the larger laboratory at the end of 1983.

The head of department, Ken Box, has been fully engaged in the purchase and subsequent setting up of the school's own field study centre in South Wales. One wonders if other curriculum developments, quite understandably, have consequently suffered.

The School

The school has a new Head who arrived in September 1983. "At present he is very much marking time, seeing what happens before he says 'right, I want this and I want that'. No mention was made of the earlier Head and his views on IT except that he was a scientist who pushed science and technology,"as it

happens, its been a successful force in the eyes of the parents....."His specific impact was on the appointment of Tom Perch about 9 years ago. The advert was for a 'physics and electronics" teacher and Tom was appointed as a 'very, very nice fellow, very bright and knew where he wanted to go'. The school under the direction of Tom was, 'one of the pioneer schools for the new A level Electronics, so on account of that more capitaton, in came more computers'. It appears that there were two PEP computers bought as soon as Tom arrived at the school in 1973. (Much earlier than most schools acquired computers and , ".....we had Neil Macfarlane around..... when he was minister (Secretary of State for Education) to have a look at it...." Tom was soon made up to Scale 3 Head of Electronics and the momentum towards purchasing more computers was maintained. Now Tom is Deputy Head and has his own micro in his office for administrative work. Another physicist was appointed just over two years ago to take over from Tom. He co-ordinates the computer studies courses across the school. Tony is not very complimentary about this new appointment, "...in fairness to him he got the job because he was next in line rather than the fact that he had the same flair as Tom had". Like Tom the new appointee was, "mainly computers, electronics/computers and then physics". No school-wide policy for IT across the curriculum was developed which perhaps explains why in a follow up letter to this interview, Tony Lichfield sent me a blank floppy disc, "in case you have any programs on geography or humanities which could be used on our Research Machines", and said that Tom and his successor wished to meet me, " to obtain information on how the computers could be used 'across the curriculum' ". There was no mention during this interview of any problems with morale in this school at the time.

The LEA

Tony lichfield brief mention of Mr David the humanities Inspector, "He's very nice. I wish we'd had him 6 or 7 years ago. We had an English man who was

in charge of the, sort of, humanities and his idea was to push everything together. I really feel that those who kept to the separate disciplines have come off better". No mention was made of the advisory teacher for IT, Paul Gomer or of LEA policy to do with computers. In spite of complimentary comments about the new humanities adviser, geography staff do not attend courses laid on by the LEA. Only Matthew Johnson, then in charge of geology and now head of department had been on the November 1982 course at the Teachers Centre and it has not had any impact. Little contact exists between school 1D and other schools.

National Picture

Wider influences beyond this school's gates have not had any impact.

School 1D 29/3/85

On this occasion I interviewed first Ken Box head of humanities and then Tony Lichfield, Senior Tutor. As Ken explains, "we are suffering from a fall in rolls,we've gone down from five groups of geography to three. It was very popular..... . We've had three schools shut around us.....declining population within this area here....." The impact is being felt on staffing. "Yes, I've got to lose two staff within this department this year". The environment in the school seems to have changed within a year. In both these interviews a good deal of comment was made about the low state of morale in the school. "I think it's more in the line of general depression more than anything.....(on the other hand) "....we've got a really dynamic crew here and it doesn't really have any knock-on effect for the kids". However, staff are weighing up more carefully their commitments and prioritising their time more carefully. Ken explains the enormous commitment he has made over the last few years to the Field Studies Centre. It has opened up a great range of fieldwork trips for particularly geography and geology.

Since the last visit the 380Z micro has been returned, presumably because it was not being used. The new post-holder of head of computer studies has "continued the growth area, there's no doubt about that..... computing has become a very popular subject within the school, so he's been in the growth area". However CAL across the curriculum is third on his list of priorities behind computer studies courses and IT courses in the first two years in the school. The staff, however feel that now," there's an open invitation to go up to the room to book it". Geography has not used the computer during the last year nor have they purchased any software. For one and a half terms last year they had a young New Zealand teacher who, "was very interested in computing". He made a useful list of programs held by the IT advisory teacher and then presented it to the LEA. He has subsequently gone to a girls private school in central London, to set up their computer department.

Ken and one other member of his department have attended some LEA organised CAL Geography meetings....."because there's a new CAL work group being set up within the Borough, very much by Martin Moseley. We've been to their meetingson-hands experience of programs, together with swapping of programs etc...". He remembers the unfortunate meeting in 1982, "I think it was just one of those things where it was held at the wrong time, without possibly enough time and publicity. I think at that particular time it was possibly low priority as well". Ken sees cost (of software) as a key constraint, "that the cost balanced against books or whatever, it just doesn't warrant that sort of expenditure, not at the moment....." He continues, ".....it's only really our CSE groups that can get down to any sort of size to start using the lab as such. Most of ours are in groups of 30". (Here he is assuming that only a lab set-up can enable CAL to take place.) He also mentions that the time-constraints on the 'O' level courses are, "incredibly tight and it would be in our opinion an area where possibly we could do without wasting time at the moment". He also criticise the software available, "A lot of the programs that I've seen are not

total good value for money..... A lot of them are fairly straight forward programs that didn't really have much sense". In spite of such reservations they are involved in collecting data for the Domesday Project. Ken reckons that it's possible, ".....because of the flexibility of our humanities course, it opens us up 6 periods a week, where we can actually get to grips with it and get something off the ground". Ken is aware of the impact of the appointment of Paul Gomer, "Basically it's given us a 'bank' of where we can go to and say ' I want to have a look at that program'..... its given us an area where we can actually go and play around with the programs..... you've got on -the -spot expertise there who can bail you out, which is quite useful". Ken Box is not very positive about this LEA's standing as a progressive Authority compared to others. He sees it as somewhere between 1 LEA (perceived as good) and Kent (perceived as bad) as LEA's go. He feels a major weakness is that limited release is arranged for staff to attend INSET during the day. Normally INSET is, "very much after school".

He feels that people are weighting up, carefully, whether to take on any further commitments. "I think people are reassessing the situation and thinking to themselves 'look if I work my fingers to the bone, I do it for 5 years and then I think some promotion wouldn't be a bad idea'.....it's not there and I think people are thinking 'oh, what the hell'..... I think pay doesn't help does it? I think that's the worst.... I've never seen, in this school, so many people being so depressed at the same thing". He also speaks at length about people thinking about or actually moving out of teaching. He has not heard about the MEP at all.

I then was able to interview Tony Lichfield. He feels that the new Head has had limited impact on educational computing in the school. "My impression is very little when I think of how much was being done before I came to yourself on the course (MA course)..... and how much is being done now..... no I think he's left this very much to the province of the Deputy Head..... who was the electronics wizard anyway, probably the reason he got the job". On the other hand the new

head of computer studies has tried to make IT less of closed shop. "I think what Victor's tended to do is to bring it down to a level where the average child in the school feels it's within his capabilities. I think apart from that, it was rather an elitist....." There is now an information technology course in the first two years. However he feels that the early lead that the school had in IT across the Borough has been lost because the two staff members most influential on early developments have changed posts. Paul Gomer moved to a position as head of IT at school 1E and since had become the Inspector for IT within the Borough. Equally the former head of computer studies became a deputy head in this school. Tony's view is that the current major constraint on the use of CAL in geography is , ".....getting at the equipment at the time you want...." (access to the two labs.) He was hopeful that the Geography 16-19 'A' level could be introduced into the department and hopes Matthew Johnson might be able to persuade Ken Box of its strengths. Matthew took it home (16-19 materials)..... I think he came in and has influenced Ken considerably, because Ken, to start with, wasn't all that well inclined towards it, but he now is, having looked at it.... so this is the hope". Matthew is clearly regarded by Tony as a force for change in the department and would be keen for him to implement CAL in the department at some time in the future.

Tony has some criticisms of the present Inspector for the Humanities in the LEA (Mr David). The earlier Inspector, "was in and out of the schools far more than Mr David there isn't the personal contact to the same extent.... there isn't enough direction from him.....they (other teachers) felt they should be given more guidelines". He was generally supportive of the LEA in its provision of INSET courses and the establishment of the Curriculum Development Centre but felt there was a general lack of resources provided. "It's supportive verbally.....it isn't supportive all that much with cash in hand".

Tony like Ken spent a good deal of our conversation pointing out the demoralisation felt by the staff and the number of staff who have left. "You've got to sum it up in one word-demoralised.....70-75% of my time is now spent in

administration and by the time you get to the class, if you've got 25% of your energy left for kids.....". I asked who of the staff to his knowledge were applying for other jobs, "Well, to my knowledge, there is the head of third year, the head of second year, and the head of fifth year applying.....the senior master is retiring early....so the general sense of demoralisation really is fantastic....people listen to other people, then they get drawn in and get equally depressed". This has all, according to Tony become much worst within the last 18 months yet he argues there is still a tremendous amount of commitment from the staff.

School 1D 17/7/89

By 1989, Matthew Johnson had become head of department and filled in my questionnaire. The school had experienced a large reduction of pupil numbers from 1150 to 780 and geography, though still a popular subject, was now affected by such falling rolls. Consequently there are now only three specialist geography teachers. One of the geography rooms is now 'networked' with a Nimbus in it. "The rest of the school has about 17 Nimbus's and 15 480Z's. There are two computer rooms that can be booked....We have quite a wide (and expanding) software collection including the latest MESU geography pack. Though the school's menu system we also have access to cross curricular software and the resources of other faculties". When asked in the questionnaire about the use of computers in geography lessons he replied, "Very little at present but we intend to rectify this same. My two other geography colleagues suffer from 'technofear' and are proving difficult to convince of the value of computing. Pupils have used FRONT PAGE EXTRA, a recent British Gas program. GRASS database and a couple of BBC earth science programs". He sees real opportunities in the use of computers in geography, "Enables more individualised work...more instant feedback....encourages co-operation if more than one person sharing the machines....improve general IT skills....helps pupils

to visualise things in 3-D, if graphics are available". As to the limitations he continues, "Obviously lack of resources both in obtaining software and the availability and convenience of the hardware. Also many of the more abstract concepts will not easily transpose themselves into realistic programs". There seems to be an interest and commitment here, "I have just completed year 1 of the MA course at the Institute and I benefited enormously from your sessions on IT. It gave me the impetus to experiment at school and also to invest in my PC..... I feel that the whole ethos of computer education has changed....it was once the domain of the science faculty but computers are now disseminated throughout the school. Also there are now much better programs on the market for geography".

Post Script

The nature of this school has changed a good deal over the last few years. From the being one of the most popular schools in the Borough, since 1984 it has dramatically lost pupil numbers. To survive in 1990/1 it is to combine with its neighbouring sister school. Within a few years this seemed to have an equally dramatic effect on staff morale. It was from the early days a school which was well equipped with hardware and had progressive policies on computer studies and IT awareness courses. However these developments were very much tied into science and technology rather than to IT across the curriculum. In spite of a unique array of geographers, three of whom have undertaken the Institute

MA since 1980, the action in CAL geography has been limited. Knowledge was generally patch and the only involvement with IT until 1989 was with the Domesday Project. This inactivity was in spite of the influences of a short-contract, keen young New Zealand geography teacher and positive intentions, certainly from Tony Lichfield. By 1989 there were some encouraging signs that the new head of department, Matthew Johnson, had begun to get things

moving. By 1990, Ken had moved to a Deputy Headship and Tony was about to take early retirement. One wonders if the lack of action was to do with Ken's frustration in not getting promotion and that Tony was not centrally influential enough on the geography curriculum.

Appendix 5.7 Portrait of School 1E

School 1E 25/11/83

Background

School 1E is an 11-18 boys comprehensive school with a roll of about 1000.

Interviewee

Saul Jacobs is head of geography and is in his third year at the school. After college he worked with VSO in Nigeria for two years, then in a school in Dartford, then a girls school and so on to school 1E. His interest in computers came from his previous school where, "...they has a Commodore Pet available and I started taking an interest then. I helped to run a computer club at lunchtime, not that I knew anything about computing....which meant that when I come here I was adjusted, if you like, my frame of mind was more open-minded.....and then of course with Paul Gomer, knowing that he was a bit of a whiz-kid, and could do things.....I expressed an interest to him, and he picked it up and encouraged me and vice-versa and its developed from there". That early interest caused him to ask the LEA for a microcomputer. "We got it in a fit of enthusiasm, I suppose, I wrote off for a special curriculum grant to the Inspector (Mr David)....This would have been December 1981, I suppose, and we got the computer by about Easter of 1982.... it was just a model A BBC computer. A member of the department donated a black and white telly.... and we set it up on a trolley ". Early on he did not feel the need to program, "My view is that I would never intend to write a programI' m using it as a tool and that's how I see its role and no more than that". I asked him what courses he had attended and he replied, "I have been on a course organised in Croydon, last April (1982) I think and it was communications technology more than anything else....very useful, it made me very aware of the potential of data bases and things like this. That's another potential that didn't occur to me at the time.....data based would be an ideal thing for administration and so on".

When asked to respond to certain statements about CAL he displayed

'progressive' views, for instance disagreeing with the statements, "The main value of microcomputers is to perform statistical analysis of geographical data" or "for the storage of geographical information for retrieval". He agreed strongly that, "CAL can help children's learning by simplifying the real world in computer games and simulations and that, "CAL can help to motivate pupils in geography lessons. On the other hand he was critical of both the quality and relevance of geography programs. Interestingly he had noticed that in spite of the increasing IT awareness of children since the early 1980s, their interest has not waned. He saw the future of CAL in micro-labs so that, "....I could take half a class along to the CAL lab and say "there's a program booted in, I want you to work your way through it, here's the worksheet and then come back at the end of it'. What other potential do you foresee, I asked, 'Skills and the other one as far as I can see is simulations, basically'.

(Subsequently, Saul Jacobs undertook the full time MA Geography in Education course at the Institute in 1986/7 and his dissertation was entitled, "Children learning in the CAL classrooms". Without promoting he had made contact with me in my office on 2/2/83 after an INSET course that he and his colleagues had attended. He had heard of my interest in CAL and was keen for me to visit the school and see what they were doing about CAL.)

Geography Department

It is a well staffed and popular subject in the school. There are three full time geographers, one teacher whose primary responsibility is geology but also teaches geography and a Deputy Head who teaches about 10 periods a week. It's a compulsory part of the first three years curriculum, is a popular option at 16+, and there are 11 'A' level geographers this year. (There are usually less than this). "It's about the most popular option at fourth and fifth levelit's always been a popular option". They have a full fieldwork program, residential with the fourth and sixth years and day excursions for other years. They have a longstanding link with the Institute whereby residential fieldwork is planned

and carried out by student teachers and tutor alongside the staff of the school. This considerable fieldwork programme, no doubt, helps its popularity as a subject.

Alongside the BBC A they acquired from the LEA, they purchased the early Longmans pack of programs, including DEMOG 1 and 2 on cassette tape. Very early on they realised that there were limitations to the tape medium and so they sold the micro to the maths department and used the money for books and software for the CAL lab which they saw as the future for CAL in geography. Asked which departments use the CAL lab, "Besides maths, I suppose it must be geography and the computer awareness course in the first year. The science department will also make use of it from time to time". In this 480Z lab they have, "...one large disc which is just full of geography programs" It includes, ".... a grid reference program for the first year. It was developed at my request.....I sat down with a sixth former one evening... and he did a very simple one with a very coarse grid and just 4 figures". They use MAPSKILLS programs in the first year, a farm game in the second year, NELCAL software in the fourth and fifth years and the Hertfordshire programs in the sixth form. Saul Jacobs colleagues have always been interested by the possibilities of CAL. The Deputy Head has his own BBC at home.....Basically, I don't think they've been influenced by myself but I think they've been receptive to it". At parents evenings the department demonstrates the use of micros, "A lot of parents come along to parents evenings.....Somebody brought their BBC in and we had a portable telly there.... we used the BBC and we had one of the 480Zs on the link system set up for the subsistence farming game so a couple of kids could go up and play on that....we had a six figure reference game (on the BBC). He was then asked about the constraints on CAL geography. "The constraints, basically are the limited number of programs available; the availability of the CAL lab; and the inclination of the teacher". Block booking of the CAL lab by the maths department, he finds a constraint but feels that a better organised

booking system for the lab would help. Another constraint he identifies is the lack of documentation for many of the programs they use off the hard disc on the 480Z system. It appears that some of these programs may well have been 'pirated' since no documentation is available to the school but was certainly made available when they were published.

Geography colleagues seem to be interested to try out the micro in their classes though there is no formal policy about CAL in geography. In spite of that it does seem to take place.

The School

The Head had an important role in setting up the recent 480Z network with colour monitors and hard disc. "He encouraged the LEA a lot of money came from the LEA there was a lot of fund-raising by the school as well. One machine was donated by a local firm". Apparently the Head has been a key facilitator in getting the school known as a leading user of IT. "That's rightand the school is really sold, to a certain extent, on its computing facilities....it's a very important part of the school". It is relevant to note that school 1E was featured in the local newspaper in an article written in the Autumn of 1982. It speaks of a local company giving £650 towards the cost of the 480Z network and suggests that the school has, "...more computer hardware than any school in the Borough". Paul Gomer is quoted at length in the piece. "There's so much happening now in new technology that to send our students out without knowledge of it is doing them an injustice". The Head is quoted as saying, "The coming generation has to be equipped to deal with computers....they will affect the employment of students. It's a new industrial revolution".

A clear and significant influence on this school has been Paul Gomer who had moved from school 1D to be, "the teacher in charge of Computer Assisted Learning. That's his special post and responsibility". He does the ordering of software for departments wither on his own volition or on the advice/request of a head of department. He will, "...tell me that he's purchased a program and will ask me to have a look at it". He will also transfer software from the 380z to the 480Z network, if that is requested. "....Sometimes he'll buy stuff without me knowing about it and he'll say "come along and have a look at this". By the time of this interview it was known that, "He is becoming an advisory teacher, he's leaving this December to take up an advisory post.....He's been doing it already part-time, a couple of days a week, setting up courses and going into primary schools a lot, as well". Paul has a commitment to IT across the curriculum and disagreed with the Head over the staffing of the computer awareness course in the first year, "..... the Headmaster wanted to have just mathematicians or people that were au fait with computers, to do it. Paul Gomer, the CAL teacher, said he didn't want that to happen. He wanted specifically non-mathematicians to do it, so we would learn alongside the kidsit worked out that's how it was; we've got one humanities teacher, three geographers, and a smattering of maths teachers, who are doing CAL teaching, plus the Headmaster who has a great interest in computers". A new appointment has been made to replace Paul, "He's a mathematician, I think he's going to be in the maths department this time. But he's going to be principally concerned with CAL". It seems in general the Head and Paul have worked together in this school to develop the use of computers. There are now two micro-labs, one a 480Z network and the other is principally, "for the maths department....and they've got about 10 BBC computers altogether". There are IT awareness courses in the lower school and IT across the curriculum has been encouraged through the appointment of Paul as teacher "in charge of computer assisted learning". The policy is clear though there isn't any written document. From the earliest days this seems to have been an innovative environment for the development of IT in

the school. No concern or mention was made by Saul in this interview of emerging problems of staff morale.

The LEA

The local humanities adviser provided this department with a micro in 1982 acting on the request of Saul Jacobs. According to the latter, this adviser was prepared to buy software if you asked. "...If you wanted to buy software and said that you hadn't any money, they would fund that for you". Saul, like so many others, remembers the unsuccessful course held at the Teachers Centre in 1982. "A lot of things happened..... a lot of the better programs were using high resolution graphics and the machine that we had there didn't have high resolution graphics, so we only had the older stuff. We had Neil Pope.... and he demonstrated what he could do with what was there and it was the most uninspiring stuff. At this time there was no advisory teacher for IT in the Borough and no written up policy document that the geographers knew about. No mention in my interview was made of the influence or stance taken by Director of Education in the Borough .

National Picture

Saul Jacobs attends major conferences such as the annual GA Conference and the GYSL National Conference, for instance in September 1982 where he saw, "...the early stages of the program they were developing then. I must admit, I was quite impressed with those; they were fairly sophisticated". On the other hand MEP he knows little about, "I've heard of it, it's rattling around, and I can't place it for the minute, what it means...that's because Paul Gomer has mentioned it". In fact the course which he attended in April, 1982 in Croydon, which he thought a lot of, was an MEP course! He reads both Educational Computing and the computer section of Teaching Geography so is aware of

wider developments. When asked if there were any other teachers in the Borough who had influenced him other than Paul Gomer and Neil Pope, he responded with an unequivocal no".

School 1E 29/3/85

Since 1983, "Well, we purchased more programs, quite a few really, in the September". The department has also acquired a BBC micro. "The BBC was won by some pupils, and I persuaded the Headmaster to donate it to the A floor, but of course it sits in here because nobody else has any programs for it". They have also purchased a good deal of software,"...and I suppose it was really from the last GA Conference, where I saw a lot of new software coming on the market, and there was very little available for the 480z, it was mostly for the BBC. So virtually all the software I've got now has been purchased for the BBC.... the money has come out of our department BSE (grant), basically, and it was a policy we decided last summer that we were going to invest in computer assisted packages. So quite a substantial amount of the BSE was set aside for that....(they spent) in excess of £100, spent on just software". "I bought CITIES and TOURISM because that fits very closely with our syllabus....(also) FIELD SCIENCE EDUCATION, that's a field study technique. We use that very heavily on fieldwork....Purchases earlier this year are the BBC INTRODUCING GEOGRAPHY, which can be use for different things". They use these program across the first and second years of the school. "They all come up and work in pairs or in a small group during the course of a lesson....I think if we want to use a whole class then we would have to use the network". As a department they take the micro regularly on fieldwork, mainly to process data. In fact a pupil has developed a program which portrays data as pie charts.

Saul Jacobs feels the quality of programs has improved, "...obviously there has been a tremendous improvement in terms of this more recent generation of

programs....We look on the computer rather like we look upon the use of video, something to illustrate a point, to enhance a lesson". Some of them are beginning to take greater advantage of the computer's real abilities to speed things up or present things in a more dynamic way than a picture can. "Saul keeps track of software developments, "I read the reviews in Teaching Geography, I think it's mostly from what I pick up on the initial phase of advertising". The replacement to Paul Gomer plays a similar role, "He will come and let me know if he comes across a particular program".

Saul also mentions the CAL Geography group set up by Martin Moseley and Mr David. "The two main ends really are to evaluate software, as a group, and then to pool experience and purchase software that can be really owned, I suppose, by the consortium and administered through the Teachers Centre...". the meeting arranged at the Teachers Centre in early 1984 was mentioned, "...I would say a good half of the Borough's secondary school were represented.....there were varied levels of experience.... there was greater opportunity for the teachers that were there to swap information...".

As a geography department they regularly attend INSET on CAL. For instance, three of them went along in the summer of 1984, to the Capital Region Information Centre (of the MEP) to look at their software collection. They also went to a one day course at the Institute, again in 1984, on CAL Geography, which I organised. They as a department, along with the history department, are collecting data for the Domesday Project.

The school has been affected by falling rolls and a decline in morale. Last year the school had to lose seven staff and even the number two in the department is beginning to worry about his position and its security. "When I hear that... another geographer may go, that is very much a downer, because that will obviously severely impoverish what we can offer as a department. I think we're getting a series of knocks, in a sense". The second in the department, Sam Royce, is concerned, "I'm a scale 3, looking at all the opportunities for promotion, they are so few and far between, that everything seems a closed

shop at the moment. Coupled with the fact that it seems as if I'm just having to hang on to the job, rather than actually go anywhere in it, that I scan the papers now quite enthusiastically". At present the school is run by an acting Head which has temporarily caused the pace of innovation to slow. The former Head was clearly a great force for innovation. "I think there is a fair amount of encouragement for curriculum development in the school, overall. I would say there's probably more innovation going on here, than in some other schools". He seems to have left a legacy. "We've got a very rich curriculum in the school now, but the problem is that, underneath it all.....very tired staff, trying to hold this structure up and that's why more or less, I get the impression the staff are very disillusioned".

Saul mentions support from the LEA. "I would say that every term or so, perhaps a little bit more regularly than that, we have a Head of Department meeting and I suppose Mr David was sort of behind the move to set up this CAL Teachers Group. But really, other than that, we've not seen Mr David....He's been into the school a number of times, but he hasn't come into the department". He is particularly little seen by the junior members of the department, there does seem a realisation that he is faced with problems of redeployment. When asked about likely future use of the micro by geography teachers word-processing and administration were particularly mentioned ".....A lot of the fieldwork stuff I produced.... the other week I used my wordprocessor". This is a BBC micro which Saul has bought for himself and his family about a year ago and is clearly used for departmental business.

School 18/7/1989

Since our last meeting in March 1985 Saul has been made Senior Teacher with responsibility for the sixth form. In that new position , he has published a newsletter entitled. 'Newspa' using a nimbus. The most important change in

the school, over the period of four years has been the reduction in school roll from 900 to its present 780 and this has inevitably led to staff reductions. Geography is now part of the humanities faculty and there are now only three full time teachers of the subject, whereas there has been four. The former deputy head, a geographer, is now Head and has been a positive support to the department, not least in encouraging fieldwork. He is not so overtly interested in IT as was the former head and as a result the school has lost its position as one of the leading schools for IT in the LEA. The former head according to Saul had a very clear policy about IT. He saw technical and vocational education as a major thrust, not least aimed at parents. IT he had used as a way of marketing the school and he was often quoted in the local papers, gained support from local companies, organised major fund-raising events all of which, "allowed the school to be at the leading edge re-technology within the Borough". The computing facilities in the school are now below average, whereas earlier in the decade it was the leader.... the school has lost its edge". CAL geography has not been helped by the new head of department being less familiar with micros than the previous members of the department, two of whom have moved to jobs in other schools and the third, Saul, has this new administrative position which takes him away from geography. On the other hand, the new member of the department has just undertaken his PGCE at the Institute of Education and took an optional course in CAL in the Humanities and did some highly innovative work in geography classrooms using IT. (One wonders if that experience helped him to gain the position and whether it might help to maintain the momentum for CAL in geography in this department). Also since Paul Gomer left the school there have been two I/c computing post-holders who have moved on. So there has been little stability in that crucial position. "The latest lady is more interested in computer studies and not so much CAL across the curriculum". Since 1983, the big development in CAL geography has been the increasing use of content free software, in particular GRASS and FRONT PAGE EXTRA. Also geography borrowed the LEA

Domesday System in part of the summer term in 1988 and they are hoping it might be borrowed again. Some software has been acquired since 1985. It includes GRASSHOPPER, STATUS, RIVERS, GEOBASE, MICROMAPPING and the Learning Geography with computers INSET pack. When asked why this school has taken on CAL in geography more than most departments in the Borough, Saul felt it was a combination of factors. First, he mentioned the former Head, who had a vision and commitment to IT across the curriculum. It was, 'a happy accident that both (He and Paul Gomer) shared a vision of computers across the curriculum'. Also, Saul reckoned he was especially lucky in having two former members of the department who were both willing and able to take on CAL geography. For instance, Sam Royce took a diploma course in educational computing in 1988 just before he left for a head of department position, indicating his continuing commitment and interest in CAL geography. He also feels that the LEA is especially fortunate in having had two senior inspectors in Tom David and Paul Gomer who worked well together, and at the same level of seniority, and had a firm commitment to and experience in IT across the curriculum. He sees that it is the Inspector level of the system, in this LEA, that has led to curriculum initiatives, not the CEO level. Such inspectors, in his experience have both the power (through resources) and willingness to support initiatives such as the INSET arranged around the Learning Geography with Computers Pack, which was bought for every department that attended. This, "support for new initiatives from the inspectorate plus keenness to take things on (was because LEA 1)....wishes to be seen as an LEA at the leading edge of new curriculum initiatives". He applauded the role of Tom David in being, "always very supportive in the background", and the way he gave the time and resources to set up and maintain the Geography CAL Users Support Group. He sees him as a facilitator who amongst other things arranged for the full time secondment of himself, Mr Davies, Martin Moseley and Tony Lichfield. However, Saul notes, "To the best of my knowledge the CAL Geography Support Group has died a

death". Saul has kept his interest and vision concerning CAL in spite of his new responsibilities. He comments on, "the diminishing amount of software available for the BBC B machines. Superior quality of 16 bit software. The increased obsolescence of the hardware and high cost of replacement, together with the consequent incapability of existing software. Lack of government support or the purchase of hardware and software... this looks set to continue despite SAT's for IT being published....very curious!". he identifies the use of content free software was the big innovation in geography in the last few years and sees that as the direction of the future. "The future lies in the increased use of content free software such as the use of databases, spreadsheets etc. Game/simulation type software is often perceived to be something of a luxury with a limited application". This reflects national trends and suggests School 1E is still in the vanguard of change in that Borough. He is also helping to deliver regional level INSET for instance at the Institute of Education in November 1989 where he delivered a workshop on data handling as a part of a one day course and similar INSET in Cambridge. When asked about constraints remaining on the use of CAL in geography, he replied, "Problems of accessibility....mobility are paramount. Also amount of hardware available. Problems related to time taken to use programs...often the tightly structured secondary school day is not suited to the kind of pupil-centred discovery learning embodied in much of the geography software available". Asked, again, why he believes in the use of computers in the teaching of geography he replied, "because I believe that pupils should be computer literate... I endorse much of the good education practice embodied in good geography software". "Why we don't?....limited amount of time available....being candid the fact that a lot of my lessons are planned at short notice". As the new head of department put it, Each of us in the department has a different attitude to CAL and has preferences for certain programs. All of us use CAL from time to time but it certainly isn't a frequent or regular activity.

Post Script

Saul, right from very early days, had an interest in computers since I the late 1970's at his previous school, he helped to run the computer club and presumably began to see the response of children and at the same time got rid of any personal hang-ups he may have had. On moving to school 1E he was joined by another enthusiast, Paul Gomer in charge of CAL at the school. . they clearly fed-off the expertise and enthusiasm of one another and this, in my view, is a critical relationship. The Head is another important actor in this environment, since he encouraged change and had the vision to appoint Paul Gomer as teacher in charge of CAL, a very unusual job title in the early 1980's. The head also helped to create a 480Z network lab in which departments were encouraged to leave their software. This geography department worked closely as a team and had had a deal of stability over the last few years. The difference with other departments, I have observed, is that they all attended INSET courses, visited the MEP Centre in London, and made use of the micro on fieldwork. The deputy head in the department had his own micro at home, the geology teacher used statistics programs in his work and the involvement of Saul Jacobs has already been documented.

His influence cannot be minimised, since he seems to have been very willing to use 'crafty' tactics to achieve his ends. For instance, asking the LEA for a micro, getting software translated for the 480Z lab, getting a BBC B into his department and generally his preparedness to go direct to the adviser with requests. He has been prepared to spend some of his departmental capitation on software and this department is more advance and experienced in CAL than any other I know and that does not refer to the head of department alone. However, during my visit in 1985, I couldn't but notice that there seemed to be the beginnings of a crisis in the school. School roll was falling rapidly, the position for 'Head' had remained unfilled for quite a time; innovation fatigue

seemed to have set in; some staff were worried about the security of their jobs; and morale was beginning to suffer.

Appendix 5.8 Portrait of School 1F

School 1F 20/12/83

Background

School 1F is a large 11-18 mixed comprehensive, regarded as one of the most popular and successful in the Borough. It is in one of the more affluent areas of a Borough regarded by some as the most 'middle class' of all those in London. An indication of this is the interest and affluence of the PTA. There has been a lot of help from the PTA. They work very hard, they raise a lot of money. They bought the school minibus....they are keen on buying obvious status thingslike our school has so many more computers than anywhere else and so on. This is their driving interest".

Interviewee

Sara Norris is one of four full time geographers. She gave me a pen-picture of herself. "I taught 8 years full time; 4 years part time (partly in Wolverhampton but mainly in central London, both grammar schools); then 11 years off; then 4 years part time at a local (in Borough 1) girl's selective school; and then have done nearly 4 years in school 1F..... the only comprehensive school I have taught in, the only time in a co-educational school, the only time I have taught low ability children". What is also relevant about her is that she is married to a University School of Education tutor (in geography!) and has three sons at school 1F. She is therefore highly informed about the school and about developments in geography education.

She is fully cognisant of the computing set-up within the school. "The 480Z network is being increased from 8 to 13. There are also several separate 380Zs. One 380z is on a trolley and can be moved around the ground floor of

the building to classrooms. The network is in one room and since September (1983) the other machines are in a separate room and the wordprocessor is in there too. That is used by the Business Studies department quite a lot. The network is used by the maths department and the computer studies 'O' level group but the other machines are in a room that can be booked, but only one machine can be taken out. There is very easy access to those machines for sixth form use who are free to go and use them during private study and staff of course if they want to". She is equally aware of the various computer clubs for different year groups, when they meet and so on. She does not find access to micros a problem.

Outside of computer studies, only maths use the micros (they run the computer club). Economics uses them occasionally and then only Sara from geography. "Well, I'm the only one who has done anything about it until now, though one other member of staff is going on a course. The head of department bought the School's Council folder (pack of programs with accompanying notes) because he was told by the head of RE that he ought to buy that. I am the only one in the department who has ever used the materials at all. We have had it for about a year and it was put away and I didn't know we had it, but last summer took the folder home and started work on it. I have used it mostly at sixth form level because I too am learning and I have used DEMOG particularly. The 'drainage basin' looks good to me but I do not normally teach physical geography so I haven't used that at all and I haven't used the 'stats' one. But most of the other programs I have run through personally, to use when appropriate but of course from the types of programs... I must keep within the syllabus loosely". She feels that the FARM program may well suit bright first years but would be unhappy with it for the less able. "It bothers me with a remedial group that becausewith one computer on a trolley, their lack of ability to participate, is quite great". She sees them generally as difficult to fit with the existing lower school

syllabuses and therefore sees the sixth form as the 'way in' to the use of computers, for her.

She regularly attends the GA Conference and for instance, at the 1983 conference, 'I was impressed by Jennings, the Scottish gentleman, they were very good..... a lot of useful material'. She has also taken the trouble to attend a meeting of the Kent GA, "where the head of geography is very keen and he ran some programs there and talked about how he used it and that was the most useful thing I have seen because he talked about how he organised a class, how he organised the work....he is enthusiastic, has a lot of resources material there and it's all up to date". Sara's views are both informed and positively inclined. For instance she 'strongly agreed' that; Geography teachers along with other teachers should help to develop 'computerate pupil', "CAL can help childrens" leaning by simplifying the real world in computer games and simulations, "CAL can help to motivate pupils in geography lessons", and that "CAL can help children handle a range of variables in a problem solving situation". "Yes, it's part of their world now and that's why I think it's important". She therefore "strongly disagrees" that ; " in the present world of 'cuts' CAL and geography should take a very low priority"; and that 'until more micros are available to teachers, there is little point in using CAL in geography classrooms".

As to the future of CAL geography in her school, "I think it depends very much on what's going to happen within the department with redeployment and staffing because under the present head of department it's likely to make no progress. If one of the two of us who so far have shown some interest are redeployed, it could die a death completely and this folder could gather dust.....it is a question of someone within the department saying, look come and look at this and see how it works and making the others sit down and find out how to load a disc into the computer, which button to press and so on.

Geography Department

Geography is staffed by 4 full time teachers and two who teach some geography. It is compulsory in the first three years and is a popular option beyond that. For instance there are 17 lower sixth and 18 upper sixth taking 'A' level geography at present. The courses followed are generally old-fashioned and in the first three years are underpinned by the Young and Lowry books. The geographers are not a team and tend to act independently, ".....we never have departmental meetings. We are given the syllabus by the head of department and we tend to go very much our own way and follow our own interests...we all, I am afraid go our own way under the system....it is not a cohesive department at all". The head of department has been at the school for close on 40 years since just after the war from primary, secondary, modern to comprehensive stance". In spite of his years at the school he doesn't seem to be powerful, "...he is a very mild mannered gently person and he is not ambitious or driving in any way. He is not politically minded at all". This has meant that the department does not have high status with the Head, "...because he won't fight for status". Nor has he been interested to fight for extra resources for geography. However the subject is popular with the children, "...because of the overall enthusiasm and standard of teaching within the department". "The head of department seldom gives guidelines, very seldom consults with us but leaves us to follow our own interests... so because we are on the whole enthusiastic, it works but if we has a department of less enthusiastic people, it could fall apart". The dated text books are supplemented by, "...staff produced resources and that makes it quite a good department really". The only other person interested in using computers in geography is head of the sixth form and only teaches some geography. However, "He is quite a driving force with the sixth form level of geography because of his interest....he is a good enthusiastic teacher. He is the only one who has come with me to the GA....he is keen on fieldwork.

Contact with other geography teachers in the Borough is remote, "...because if there is any paper contact, it is done with the head of department who doesn't always pass on any information so we tend to have little contact outside except people we meet socially". There is an imminent threat of redeployment within the department and consequently morale is low. "Morale is very low at the moment because the head of department is unlikely to go....so it means there are three of us who are likely to go and it is very bad for morale especially as it is likely to be the end of the year before anyone knows what is happening". When it was suggested to Sara that therefore now was the very worst time for curriculum development she replies, "Yes the head of department even considers aims and objectives unnecessary and little can be done until this gentleman retires.

The school

Throughout the interview no mention was made of the Head's stand/position on IT except to say that he, along with the PTA, sees computers as providers of status to the school. No mention was made of any school-wide policy about computers. Until four or five weeks ago there was no official position in charge of computing though the head of RE did it on an unofficial basis, without any time allowance. "...He already had his head of department (salary) but he was keen and enthusiastic and has worked quite a lot with Neil Pope and people like that. "It has been done with goodwill of the head of REwith fanatical enthusiasm". It was a hobby that became used by the school but they have now appointed a member 'O' the maths department to be head of computer studies. He (the recently appointed head of computer studies) became vigorous in his applications for head of computer studies elsewhere and so it was realised we needed a head of computer studies... he has been teaching computer studies, sixth form anyway, and from next September there will be a

small 'O' level computer studies group and he is hoping to build up to 'A' level computer studies which isn't possible at the moment of course..... He has a dozen doing computer studies in sixth form ('O' level) and they all got A's (at 'O' level).... the new department (computer studies) will have an allowance.....individual subjects will be financed from this department....they won't come out of individual departmental funds which for geography is going to be marvellous because he is keen, he knows what's available". Staff morale has clearly suffered because of the impact of falling rolls as was seen earlier in the case of the three geography staff. However no other comment on this was made by Sara in our conversation.

The LEA

No mention was made in this interview of the impacts of LEA advisers or the Director of Education. The present head of department, to an extent acts as a barrier to information getting through about LEA activities. Sara does remember the unfortunate CAL geography meeting run by the LEA in 1982. "Well, it was well attended. There was a problem that the software and hardware were not compatible so we saw a very limited number of programs....it was a pity that we only saw some of the older programs... and of course there have been a lot of improvements and some of the older ones are very sketchy.

National Picture

Sara had not head of the MEP but along with the head of sixth form had been monitoring software each year at the GA conference. She also had attended the conference laid on by the Kent GA.

School 1F 20/4/85

Sara took over as head of department in September, 1984 because the former head of department, "retired very suddenly at the end of the summer term". Before the announcement of that last minute retirement, "....two of us were asked to go for interview for a scale 1 job at another school in the Borough". Last year redeployment, "seemed very, very dominant because so many people were involved (six in geography)". The subject is maintaining its popularity, "...we do take a lot of sixth formers in from other schools...we lose all our best 'A' level pupils to the sciences". Sara has been able to make some syllabus changes in spite of limited notice of and time in the job, and all the money (for 84/85) having been spent by the former head of department. "Most of the changes (purchase of books) we weren't consulted on, a lot of it was adding to books we had already. "My department is, at the moment, beginning to disintegrate around me....there's a possibility that I shall lose 2 members of staff. (In addition to this she has already lost two full time geography teachers). Her main objective, given the insecurity of the last few years and lack of team work, is "To make an integrated department that works together rather than as five individual doing what they please...it's got to happen very slowly and as tactfully as possible". Morale of the staff and their commitment seems to have suffered. "Not many people looking to get out of teaching. A very low morale....A reluctance to take on extra things...the phrase is, "if you do that it will become custom and practice"....in effect, its been more talk and misery and fed-upness than actual physical direct consequences". School 1F has been a school where the staff are all still there at 5 o'clock and I think that in the Spring, partly because of bad weather and partly due to people's attitude, there was very much more of a tendency to be out by 4 o'clock. The industrial action had had less effect here because the staff are split between three unions. " I think it's effective in a school where one union is dominant. I then asked about the impact of the new head of computer studies. "Nil, I would say...he's not very

good at imparting information to the staff. Out of fairness, he did make some attempts to get other departments involved in computing. He found it very difficult to impart his information to others members of staff...I think he couldn't accept how dim we were at computing which made it difficult...but apart from that he hasn't done anything. Normally, without any distraction, he finds his own commitment all he seems able to cope withhe would prefer to keep the microcomputers for computer studies. I don't think he wishes to share.....you have to fight to get computer time". His title is "Head of Computer Studies' not Head of Educational Computing which is significant. The Head does not seem to have a view on IT across the curriculum. "I think the Head is totally unconcerned by the whole matter. I think that he like to say, 'we were the first school in the Borough who had a network of 13 computers.....good old PTA, good old Borough, look at our lovely computers" but he's not interested in it.....He thinks it's a gimmicky thing really". I asked if she received any information from the head of computer studies, No, no....in many ways much less, because before he became head of computer studies, the head of RE was involved and he was much more interested in the wider applications of educational computing". The one other member of the department who Sara had begun to interest in the micro is 'my potential leaver.' She had been on a locally provided elementary computer awareness course. Sara was pleased with the LEA initiative to establish a CAL geography group. (Work of Mr David and Martin Moseley) I think it's an excellent idea. It was very good initially to get together and find out that all schools in the Borough have similar problems of access to computers..... computer studies and maths departments hogging it'. She highly commends this initiative of setting up a CAL geography group in the Borough and remembers clearly the first meeting in January, 1985 earlier that year. "Well, it was mainly an introductory meeting to discuss what we were going to do and how we were going to , what the Curriculum Development Centre was going to do in terms of acquiring materials, what could be copied free of charge...we would get together and we would look at programs together

and discuss whether we thought they were worth purchasing..." 'a second meeting, which virtually failed because of industrial action and a third meeting fixed for the end of summer term...because I don't think 1 meeting a term, an hour a term, is going to achieve anything". Her evaluation of the initiative was, 'Brilliant, really. That sort of thing must be done, I think. A combination of effort and evaluation of the programs and of ideas and worksheets and so on. A morale booster in terms of persisting rally. "It has shown me that other schools....they have the same problems as we do of access and computer time and so on...which is encouraging...but the point is obviously that one has to fight for computer time, not just class computer time but access, to me look at the program, that sort of thing". The LEA is prepared to purchase software that teachers want and then it can be borrowed from the Teachers Centre. At the meeting in January, Arthur Sterling who was later to be made advisory teacher for IT in place of Paul Gomer "...made the point that he felt that computer studies people were making it difficult for the rest and one must fight for one's rights in computing.

Progress has been slow in using more IT in geography, 'But we've really progressed very little in teaching, except using what we've got with the sixth form and using the CLIMATE one. "Her views on the quality of software are interesting. "The amount has increased but I'm not at all sure that I think the standard has actually increased". Time required to prepare for a CAL lesson is a major constraint in Sara's view. "But it's so time consuming in preparation which is what I hope that the Borough group will eventually be able to pool, because as geography teachers in the Borough, we don't yet communicate in a lot of areas and there's a lot more could be done in terms of co-operation. We tend to be very individualistic". Sara feels that getting staff interested in such curriculum developments is not easy and the only way, "seems to be for me to do the basic work and present them with the materials because they're not interested....it's because of the amount of work involved.

Sara is both critical of the LEA and her own school when it comes to support for curriculum development. There's a lack of in-service courses, a lack of finance, a tradition..."don't know, I may be a bit unfair. The school I am at is very academic, and the Head is very isolationist from the rest of the Borough, so it could be that it's that.....Curriculum development is still a bit of a dirty word and there's no one in charge of curriculum development.

However her view of Mr David is highly positive, "...is very supportive and is very active but the Borough as a whole is not". She much appreciates his establishment of termly head of department meetings, "...that's a tremendous source of information and progress really". "Those of us who've had contact with him, have a very high regard for him but then he hasn't had close contact with many members in our department...but I think Heads do their best to keep him out of the classroom as they do with HMI's and anybody like that..... He comes to the school but the Head keeps him away from contact.

Sara's perception of the role of Paul Gomer and the LEA as far as educational computing is concerned is that, "It seems to be mostly a question of acquisition of hardware. Perhaps the Borough sees itself in the same way as the head, 'we have got 7 computers....

I then asked Sara how far having a university tutor in geography education as a husband and three boys interested in computers (one subsequently read maths and computing at university for instance) has influenced her. "I think that's most impossible to answer because it's a sort of thing you absorb without realising. Perhaps that's why I'm more interested than anyone else in the department. Perhaps the only other person that's at all interested is the person with two young boys and a husband who are interested in computing through work and through play... To go back to the point about computer awareness and families... the more I think about the question the more it is that it's only two of us who are interested that have got husbands who use micros and children who

use micros and the other three are not interested and have no contact outside school.....

school 1F July 1989

Sara Norris filled in my questionnaire and explained that all geography staff had changed except herself. She now had two probationers in the department , had taken up 16-19 'A' level since 1988 and the subject had become more popular. There are now 140 taking GCSE this year and 26 taking 'A'level. The department now has its own BBC micro and there is now a Nimbus network in two rooms. No further geography software purchases have been made except MESU geography pack. Quite a bit of software is now used across the years; FARM GAME with the first year; DRAINAGE MORPHO with the lower sixth; CAPITALS GAME with various level; RICE FARMING with the second year; GRASS with all years up to the fourth year.

The main opportunities she sees in using CAL are; interest and variety in syllabus; fulfilling cross curricular IT; useful for number crunching;. The limitations she notices are Hassle of getting a room; access to network; arranging group work; takes a lot of planning for something you could sometimes do more easily another way. Various courses have been attended by geography staff over the last few years; Spreadsheets, 1987 ; Domesday Project, 1987; Baker Day introduction for probationers, 1988; 5 day LEA course on the MESU pack attended by one person 1988-9. The final comments Sara makes on the questionnaire are interesting; "Increasing use very slowly. Probationers much more willing to experiment, teach group work etc.

Post Script

Although this school has always been well stocked with computers, there has not been a tradition of CAL across the curriculum and the views of both Head and present Head of computer studies reinforces that. The former head of department had clearly been a dampener on curriculum developments and the lack of continuity or teamwork of geography staff had been an ongoing problem. Stability, for the moment, seems to have been achieved. Perhaps it shows how powerless one keen and aware member of staff can be if the surrounding environment is unfavourable. It is interesting to wonder how important home and family influences are on teachers' attitudes/action in relation to computers?

Appendix 5.9 Portrait of School 1G (includes 1989 interview with Martin Moseley as AT)

School 1G 21/12/84

Background

School 1G is an 11-18 mixed comprehensive school which was the one purpose-built comprehensive in the Borough. Martin Moseley, my interviewee, describes its catchment area as "Almost entirely privately owned houses....working-class, upwardly mobile (parents),....is probably Division 2 in terms of attractiveness to parents, in terms of results, but that's looking at results in absolute terms rather than relating them to ability". (Most children are in the middle band of ability as defined by the Borough. Out of a year's intake of 180 pupils, there would only be 30 who have gone to grammar schools.) because this locality is on the edge of London, the houses are relatively cheap and many young married couples have moved into the area buying their first house here. It is an oversubscribed school and takes seven forms of entry when it was planned to be a six-form entry school.

Interviewee

Martin Moseley is both head of humanities and geography but at present is on secondment for a year to undertake the full-time MA Geography in Education course at the Institute of Education. (He subsequently successfully completed that course which included dissertation research on mixed ability teaching. He later became the compiler of the 'Learning Geography with Computers' INSET pack which he completed at the Institute in the academic year 1986/7). He has been at school 1G for nine years of its ten year life and before that taught at a West London independent school and then as head of department at a central London grammar school.

He was aware of the possibilities of CAL in geography for several years. "....we bought the early pack, which I think was published by Arnold, which originated in Chelsea College". That was in the early days of CAL, was in the early 1980's and was cassette software. Though he admits, "I have to confess that we haven't use it....The only bit of that we've used.....has mainly been for public displays.....has been DEMOG 1 and DEMOG 2". "I went on the GYSL conference in 1982 and they had NELCAL.....TOURISM..... there was a population migration one and there was a sort of correlation one". He has attended local meetings on CAL including the unfortunate 1982 debacle. He also through meetings of examiners and the 14-18 Project got to know Martin Bland, a software developer and enthusiast for CAL. As a result he subsequently wrote to the LEA adviser, Mr David, suggesting that he (Martin Bland) be invited to a meeting in the Borough. This did not happen but it may have been one of many factors which brought Martin Moseley to the attention of the adviser. He is full of good intentions about CAL in his department but guiltily admits to very little 'action' so far. "So we must get the programs and get the thing going in a small way, then we can put pressure on the Head or impress Mr David in the hope that some extra money comes up...I think that's probably our choice. At the moment, we're just waiting".

When asked to react to various statements about CAL in geography he comes across as both informed and positive in his views. "I think we would probably agree that the geography classroom of the seventies is probably typified by the transmission model and with CAL putting the emphasis on the individual, or small group work, I think that probably would count as a transformation.....I would have thought Geography has an enormous number of programs and seems much better equipped than almost any other subject".

Geography Department

Asked about the standing of the geography department in the eyes of the Head, "I would say that probably we're in the division 1, as far as the Head is concerned and I would support that with two statements. One, he gave us 1100 BSE (allowance) last year and two, we've had significantly better exam results than any other department, over the last couple of years.....we're the only department that runs a successful sixth form one year 'O' level course".

There are three specialist geography teachers in addition to Martin. The second in the department, Sally Low, has been at the school for seven years and at the time of the interview was acting head of department. She has attended two geography courses at the Institute of Education, one of which was a computer course. "She's interested in computing.....She was at Birmingham, and she acted as a sort of research assistant, I think, at CALUSG (Computer assisted learning in upper school geography and the first effort in the nineteen seventies to develop CAL in geography)....She can program, she has that interest". The third member of the department is in her third year at the school and Martin is pleased she is in his department. "Yes, I would say she was good and I am very glad that we have got her. She certainly is able and willing and keen and enthusiastic and gets on with things. A very good sort of person". The fourth member of the department is in her second year of teaching and is most likely to be affected by possible redeployment which the school may have to face in the future.

The geography curriculum seems relatively progressive and has evolved over the nine years of Martin's tenure. For instance, an 'O' level course based on the 14-18 Project is followed for 'O' level, and the CSE course is based on the GYSL Project. Large numbers opt for geography at 14-16 level, 100 a year, though A level numbers have been small. (about 4 a year) They are a well

equipped department with three specialist rooms, two overhead projectors, a 16mm projector and a couple of slide projectors.

Apart from displaying DEMOG at parents evenings or at Borough events they only make use of the computer in the first year where they use a farm game devised by Sally Low and her boy friend, who is head of chemistry. "In 1982 and 1983 every first year pupil had hands on experience of operating the game". With this LADYWELL FARM GAME. "Pupils worked in groups of 4 or 5 to enable each pupil to have hands on experience. The groups were withdrawn from the class at the rate of two or three per lesson". Martin perceived the constraints as being getting access to the network room which "is impossible before June I would say, "(because of its use by a range of computer studies courses) They have also been busy developing their 'A' level course. Sue has said to him several times that there needs to be a second network to allow geographers to get access to the hardware. "She was almost saying that it just isn't worth it unless there is a network available". This department has certainly attended, between them, a good number of CAL geography courses. Sally Low has attended a four day course at the Institute and the third member of the department went on a three day course run by MEP at Kingston in 1982. On her return she was keen and "she had been able to acquire a couple of simple programs, but again, probably a management fault on my behalf, it was not exploited enough in some way". One policy move made by Martin was to put Sally in charge of CAL but this has had little effect since Sally feels they have to wait for a second network. Martin has been disappointed with the lack of action that Sally's appointment as i/c CAL has brought about.

The School

No clear policy about IT In the school, held by the head, came through to Martin, "I couldn't say. I've never has any indication either way, really". On the other hand, "There's a Head of Computing. He's only been at the school about a year and he's implemented a lot of changes.....he had the time, the energy plus the inclination to get things moving, to make his presence felt". He was a former Head of Computing at an ILEA school and when he first came "he was given a very light timetable for two terms". (perhaps an indicator of the Head's policy on computing!) "The computer room now has a network of 480Zs.....he has got rid of all the 380Zs....he's given them to other departments". "He started off by saying that he wanted to put Computer Studies onto the curriculum in the first, second and third years and he wanted it to be a compulsory element of the curriculum". This Martin and other heads of department resisted since it would have meant losing time for their subjects. So this suggestion never came about and now the network is used for computer studies at CSE, 'O' Level and 'A' Level. It seems that such courses are growing rapidly and that the Head of Computer Studies doesn't have the time or interest to encourage CAL across the curriculum.

The only other 'actor' mentioned in this school by Martin was the deputy head who, is "timetabling and writing commercial programs. Apparently he spends a very substantial part of his day sitting at that. (a 380Z) He writes good programs and they've been published". (These are administrative programs used not least for timetabling). During this interview, no mention was made of problems in this school of industrial 'action' or low morale.

The LEA

Mention was made of the unhappy meeting held at the Teachers Centre in November, 1982. Subsequent to that meeting Martin had spoken to Sara

Norris's husband, an expert in geographical education and based at a University School of Education. He had said, "I thought that meeting was quite a good illustration of the sort of difficulties one can get into with CAL". As Martin said, "Oh, it was so boring....it was incredibly boring....I think any meeting about CAL where there is one screen and one terminal is boring....And the other thing is that comments like 'I'm not sure if this will feed in, because I don't know whether this is a 32K or 78K and this program requires 94K'.....it really was pretty desperate, I think". The only other contact with the LEA mentioned in the interview was when Martin had got to the adviser asking if the geography teacher (Martin Bland), who Martin had got to know could be invited to the Borough. To date that suggestion has not been taken up.

National Picture

Martin and his department have attended a variety of conferences including the annual GA and GYSL conferences, and the MEP was mentioned as the provider of a three day course at Kingston. No other influences were mentioned.

School 1G 19/3/85

This meeting began with yet further mention of the unhappy LEA meeting in 1982. Apparently it was particularly problematic because so many people turned up, presumably to be frustrated. "Well, I think it was a disaster because the approach was having a program running with one micro at the front.....and I think Neil Pope really was just not very well prepared, and I think trying to run a meeting in that style is courting disaster". Martin felt that the Borough had probably been set back by such an unsuccessful event. An important initiative to do with CAL geography was taken at a head of departments meeting in late Autumn, 1984. "Well, we had a head of department's meeting and I suggested having some sort of CAL group.....one of the reasons I wanted to do it was that I

was keen to be involved in some way at the Borough level in teacher education, and also my own experience and knowledge is very restricted and I wanted to improve it". The first meeting of the LEA CAL geography group was in January 1985 and went well about twenty teachers turned up. Ros Wilton was asked to say a few words. Martin knew her through her husband who had been and ILEA advisory teacher for several years and they both lived locally. Ros, at the time was an ILEA head of a geography department but also had some time allowance to do a CAL geography advisory teacher job. At the meeting Ros spoke and then there was discussion as to how this new group could work. There was agreement, "about having programs available and for teachers to come and work in groups, small groups, on the programs.....evaluating if you like.....and then reporting back to the rest of the group.....a way of becoming familiar with one program, learning about some other programs and working with a colleague from another school". At the meeting, Sally Low spoke about the FARM program she had written and encouraged people to try it out later if they wished. Also at the meeting was Arthur Sterling the newly appointed advisory teacher for CAL. "He demonstrated one-finger programming and he had programs on a big disc and he went through the five very simple steps, which I think is what's needed.....he gave out a list of the geography programs that have now been obtained and are held at the Centre (Curriculum Development Centre)". These have been purchased because Martin last term had sent a list of geography programs to Paul Gomer for the LEA to buy. To an extent martin seems to have engineered that meeting since, "I picked on people that I thoughtI said , 'What do you think we should do?" In the discussion he involved Saul Jacobs and Sara Norris.

Another meeting was arranged for one month's time. This proved a failure for two reasons. Firstly, the letters didn't get sent out to geography departments and secondly, it was the time of the 'action' for members of the NUT. "And so a combination of the action and this huge foul-up (postal problem) meant that we

had six people including Mr David....but we carried on". Clearly Mr David had been keen for Martin to co-ordinate this initiative. Martin Moseley was positive about the influence for Mr David. "I think he's made a definite impact in that there is a curriculum development fund and when there wasn't a geography adviser, I wouldn't think any of that money went to geography departments, whereas, now there's a geography adviser some of that money is allocated to geography". He compares Mr David very favourably with the previous post-holder, "I can remember when we started the 14-18 Project I wrote to him and got no reply.....The other aspects of the impact are that we have regular heads of departments meetings, once a term, that are planned and there's an agenda and so on.....he runs these sixth form course...he isn't averse to bringing people in. The best example of him bringing people in is active tutorial work and active learning where there is a team in Lancaster and he has brought them in to run courses....Other things that I can mention that have happened recently would be the Domesday Project, which he is writing". "His style of working is a very relaxed one....he's not starchy and he says things like 'strictly between ourselves' and the rumour is that he supported the teachers last summer....He's not at the end of a 'phone', but I've always found that if I've 'phoned him up and left a message or if I've written to him, he 'phones me back. So he's accessible in that sense....his style of working tends to be very informal and he establishes good relationships with the staff, but he seems democratic in that he wants to know what people's desires are or what their needs are rather than imposing things". However in Martin's view Mr David has a problem in getting schools to work together since the long established tradition has been one of isolation. So in the case of CAL geography, Martin identified schools 1D and 1E as innovators but, "I don't think they are so much influential on the others, because there hasn't been a close sort of network,. I think they have tended to be fairly isolated". Finding out what is going on in other schools is difficult. "Yes, I think the only way one would find out is almost by accident....when I came up to the CAL meeting at the Institute last year, I bumped into Saul

Jacobs in the train and got talking to him about the work he was doing and discovered that he's got quite a lot of work and resources on Docklands....".

In his own school Martin was having some difficulties getting access to the network room since the head of computer studies had no interest in or, to be fair, brief for CAL across the curriculum. His interest was to offer computer studies for the more able beyond 14 and to introduce computer awareness in the lower school. "What he tried or what he was angling to introduce was computer studies in the lower school....I think that would involve teaching the children BASIC and programming and things like that". When Martin found it impossible to get all his first formers into the network room, he mentioned this to Arthur Sterling who somehow used his influence to get that access since the networks were set up by the Borough to bring about IT across the curriculum. Clearly Martin over the years has been irritated by the strict 'gatekeeper' stance of the head of computer studies. At a meeting for third years about options Martin had to follow his presentation. "He takes this firm line and would seem to be running a course for more able pupils....he takes the line that they have got to pass an aptitude test.....so he said his bit about the test and the large amount of academic work in computer studies.....and then I stood up....and I started by saying that computer studies....you have to have a test to get into it.....whereas geography anyone can do it....everybody has got the chance to show what they can do,....you are all going to have to work with computers, and in geography next year we are going to work with computers.....I felt I had to say that, so we are committed really to putting CAL into our fourth year courses....so I think we have got to sell ourselves, and following on this computer studies chap gave me that opportunity and I felt what he said was so outrageous that I had to say something positive".

The head has given the head of computer studies a computer studies brief but doesn't seem to have any policy or knowledge about CAL across the

curriculum. "I think in his school probably most people have latitude and there's little direction from the top".

He is impressed by Sally Low's knowledge about computers but is disappointed that she has achieved little at school 1G. "Yes, she's maintained her interest. It's maybe not the sort of interest that will overcome obstacles in order to implement it in school but she knows a lot....she's not a crusading person.....I'm not sure she's such an innovator in fact...but she hasn't demonstrated, I don't think, the ability to take a major innovation and get it launched and established". He feels he is going to have to take over the responsibility for CAL geography back from her. Martin gives the impression that he has kept in touch with the developments in CAL geography. "There's a lot of activity and a lot is being done to try and develop CAL as a genuine aid to learning and leaning with higher order types of learning rather than lower order trying out and testing their skills. I think there are some good programs on the market now.... I think it's moved on enormously, from three years ago, when you ran your course at the Institute ". However the action does not match the rhetoric! "The only CAL geography would be in the first year using the FARM game, but that's all". I then asked what sort of impact the MA course had upon him. "I read everything that there was really on CAL geography.... I think it's very important to have a wider view, so that one can see CAL geography in a wider educational context..... and also because I had that knowledge and I was keen to do something about it, I saw Mr David getting this group together in the Borough..... They (school colleagues) think I'm more optimistic and cheerful..... I have got a wider perspective and I've managed to do a bit of reading..... I realised how worn out I was and I haven't got that worn out this year". He also developed the ambition to move into advisory service. "Yes, it came about as a result of being on the MA course. Before then, I had no other ambition and I didn't feel I would be able to do anything other than say where I am now, which is a great pity". I think one of the consequences of being bogged down, even if

one is working very hard, one is vulnerable to criticism....people have undermined my confidence, and having the year out made a difference.,..... I think as a result of looking back on my experiences, I am not vulnerable to criticism, I can be criticised, but I would now be prepared to tell the people.....yes, counter-attack".

Post Script

Martin has mentioned the tradition, established in this Borough, of successful attendance full time on the one year, MA Geography in Education course at the Institute of Education (1983/4). He had a good deal of experience prior to arriving at this school, where he has been the head of department for nine years. The department is strong and progressive. Over the years he has written to the adviser (Mr David) suggesting various initiatives, not least in the area of CAL. This directness and enthusiasm may well have caused him to be noticed by the adviser and eventually picked out as the co-ordinator of various LEA geography initiatives. A positive professional link was established and strengthened between Martin and the adviser, leading to Martin being made the co-ordinator of the CAL geography initiatives and the encouragement to submit TVEI proposals for school 1G. The MA course changed his career, not least by giving him confidence and the hope and ambition to move into the advisory service. That hope has yet to be realised and has been problematic since has caused him to be both frustrated and unsettled, particularly in most recent years, having applied for positions for well over five years, yet with no success. At his own school, there has been limited action in CAL geography, given his interest and role within the Borough. He has been disappointed in the failure of Sally Low to succeed in her position as i/c CAL geography. He also has found the head of computer studies generally uninterested in bringing about CAL across the curriculum and one senses a certain personal/professional animosity

there. It is strange that I sense a lack of depth in his knowledge and understanding of IT in geography in spite of the veneer of rhetoric.

Martin Moseley, ESG AT 18/7/89

Since January, 1989 he has been full time head of the recently established urban studies centre in LEA 1, but for one day a week he is seconded as and ESG AT (Advisory Teacher) for humanities. He explained that since the meeting in January, 1985 with Ros Wilton, the ILEA AT, the CAL geography group has continued to meet, though some meetings had been affected by the 'action'. Martin felt that several of the meetings were less than successful because they, "lacked ~~the~~ classroom relevance which teachers are looking for". The only direct impact was on Mike Crosby, head of department at one of the borough's so-called 'super selective'. In 1986 he demonstrated to the CAL geography group, the use of QUEST for handling river data but his was found to be "too complex for a lot of the teachers to understand, so it came to nothing". As he put it the 'pack based meeting' held over three days in June, 1987, in which they tried out different elements of the 'pack', was met by a favourable response from the teachers. This was towards the end of the academic year 1986/7 in which Martin had been compiling the pack at the Institute of Education. It was a well attended and well planned course with workshop sessions run by Saul Jacobs, Tom Davies and Mike Crosby. Arthur Sterling, the IT advisory teacher, led a session on progression of IT skills and Tom David the humanities Inspector led a session of IT skills and industry. Clearly Martin saw the course as a way of receiving early feedback on the pack. However in spite of three quarters of all schools being represented, the later impact of the course was not as great as Martin had hoped. He felt that was probably because of the delay in getting software into the schools subsequent to the course (it took two terms) because of the need to acquire licences for the pack's software. "I guess it's (the CAL innovation) a slow process" remarked Martin. GCSE was a major focus for the work of the borough's group of geographers during 1987/8 but there was still demand from them for more INSET for IT. This

led to a one-day INSET day on Domesday led by Tom Davies but more particularly by an innovative exercise planned and organised by Martin Moseley. The 'bait' for teachers to attend was the donation of a free 'Learning Geography with Computers' pack to each department represented. On February 10th, the first of this exercise the pack was introduced and Tom David did a session on evaluating someone's lesson. The next meeting was July 5th, at which teachers were to report back on a new use they had made of IT in their situation since that February meeting. As a part of the venture there was a half day of supply cover available to allow each 'partner' in a pair of teachers to observe their partner's CAL lesson. 21 teachers came to the first day of the course and 16 to the second day. Of those 16 teachers, 15 did make a new use of IT in their geography teaching. Martin was 'reasonably encouraged' by the result of this experiment, "but they needed ongoing support". His offers of help to work alongside teachers in their classroom was however, not taken up. "Outcomes in some ways have been disappointing (given the inputs) but in another way it just shows how difficult the process of real change is. "In schools which were represented on the course the average number of pieces of software was three and just 2/3 schools had used 6 pieces of software". At this interview he gave me a copy of his report on his work as an ESG AT during the Spring and Summer terms of 1989 (see Fig.). The constraints he identified, on the introduction of CAL geography, were; access to networks; land-liners to networks from departments were found to be unreliable; network managers found getting geography software onto networks a lengthy and difficult business; only one or two computers in a geography classroom were still conceived as a problem. With this in mind he intends to work alongside teaches in classrooms next term (autumn term 1990) but from spring 1991 he will focus on history. He is still thinking of other innovative ways of encouraging CAL geography. "But progress is slow" and geography is going to have to take a back seat in LEA priorities for a while. He is conscious that the pack is a rich resource but at the same time is confusing if teaches are not led through it

systematically (that is given free choice) on an down/focused emphasis, and is thinking of running a session on 'Development and IT. I then asked him why he had become involved in IT in geography. It had been the MA course at he Institute which "had caused him to realise the importance of IT and wished to do something to promote itand I suppose career ambition".

Reviewing the Borough-wide progress in CAL geography he acknowledged that school 1E "was the leader but now have slipped back....understandably because of various pressures on them for example staff cuts". He accepts that in school 1A Mrs. Rolfe had "not much truck for computers" and has not been to any of the LEA courses. "She had one negative experience and has not budged since". He sees hope in the recent appointment of Matthew Johnson as head of department at school 1D where "he is doing things this year". He identifies the key role of Tom David in his "setting up of central courses" to which he has often contributed. Martin sees him as highly supportive of himself and meets with him regularly. "Other teachers complain they haven't seen him for 18 months". As to the role of Paul Gomer, "Well, he accepted and funded the recent ESG type course.....he is at a high level of management not at the practical level of problems....certainly Gomer has had a lot of resources and given support not schools.....the policy is also very forward looking.....the problem is that the policy is implemented through school IT co-ordinators and a lot don't have any vision at all.....network managers are quite often a constraint". Apparently given their many other responsibilities they have, "no or little room for IT across the curriculum".

Post Script

This LEA has had the benefit of a good number of INSET initiatives on CAL geography and there is quite a number of keen and experienced individuals. Even so, progress is relatively slow and a good deal of hand-holding is still needed. The borough has innovated with a number of new types of INSET

such as the recent 16-19 course on the Channel Tunnel funded by ICL. This was also true of the two and a half day CAL course delivered in 1990. Although the Borough policy and advisers are helpful in bringing about CAL geography, there are still a number of 'gatekeepers' in schools who lack the vision for IT across the curriculum and are dominated by a 'computer studies' perspective.

Portrait of Tom David

Tom David, Humanities Inspector LEA 1.22/12/82

At the time of this interview, Tom had been in post in LEA1 for one term. His previous position was as advisory teacher for the humanities in South Tyneside. There, he had some responsibility for CAL alongside the adviser for educational technology and the maths/science adviser. The questionnaire I sent out to LEA advisers with responsibility for geography in June, 1982, he filled out for me, himself, which indicates a good personal knowledge of IT in that LEA (several questionnaire responses were filled in by computing inspectors since geography inspectors were not sufficiently knowledgeable). For instance, he was also able to list the details of the 13 pieces of geography software held at that LEA's resources centre. In 1981 he had been partly responsible for, "a general course..part of a series of 20 identical general awareness courses...each course a half day, covering the nature of the computer, some history and an opportunity for hands on experience...20 geographers attended each of two such sessions." As a follow up to that course he organised two half day courses for geography teachers which allowed more time to look at and comment on programs. Then in 1982 he organised, "a one day course led by Patrick Wiegand from Leeds, looking at the ways in which teachers have used the micro in geography." He had hoped to follow up that latter course by starting up a user group who would use, evaluate and comment on programs, but these plans were curtailed by his appointment to LEA 1 as humanities inspector. Even at this relatively early stage (summer 1982) he had developed some clear views of the dangers and potentials of CAL. "I feel that there is a danger of computer freaks going overboard and in the long term being counter productive. The needs seem to be two-fold; to get teachers to identify areas where the computer can help; and to get teachers to accept the computer in the way they have accepted the OHP or video recorder. The first step towards this is for lecturers and advisers to get programmers to produce sensible geography programs rather than the present diet of sensible programs which may apply to geography." Tom's first attempt to engage geography teachers in CAL geography in his new LEA was through the less than successful meeting in November 1982 at the Teachers Centre. There was a 10/15 minute introduction by him in the form of a cynical view on CAL geography, then a 45 minute demonstration of TRADEWINDS by Neil Pope. Neil was to demonstrate how to load it, then how it could be used for both first year and sixth year groups. Finally, there was a 10/15 minute question session with Tom at the end summarizing how they could progress from there, with the possibility of a meeting the next term to see how others were using CAL via the use of videotapes of CAL lessons. Tom David made no mention of the unsuccessful nature of this meeting but chose to say, "...many teachers knew little about tradewinds let alone anything else...they found it difficult....they did not understand the program."

After a month or so in this LEA he felt that dissemination of information from the Capital Region of MEP was not as good as for the North Region, but he admitted he was very much more on the periphery now whereas he was much more directly involved in the Northern Region of MEP.

In his early meetings with geography teachers, he immediately identified heads of departments as the key group, so he had an early meeting with them in the Autumn term of 1982. Three working groups were established, to organise a teachers conference, a sixth formers conference and to focus on resources.

20/12/1983

At the start of this particular interview Tom spoke of his hopes for the recently appointed advisory teacher for CAL, Paul Gomer, who was to take up office in January, 1984. "He is starting in January, specifically for CAL...he has obvious links with Saul at school 1E, he is therefore sympathetic to geography. He has already written a couple of programs related to geography and I am hoping to get him involved with a group of geographers...there are people like Saul; like Mike Hobbes(a teacher for whom he had great hopes as an enthusiast for CAL geography but who subsequently did not realise that promise as a peer group leader.); like Martin Moseley who I can see as being quite a useful little node..." He identified three schools as being strong in educational computing; school 1E as being 'particularly strong'; and schools 1D and 1G as being 'quite strong'. He maintained, as in the last interview, that the Capital Region of the MEP was less effective than the Northern Region. "I haven't really changed views...it's very much computer studies." He was critical of the range of courses on offer.

An increasing element of his job has become the impact of falling rolls. "School rolls are still falling as everywhere. We are in the process of closing one secondary school. We have to lose 60 teaching places this year...most of the 60 will be done by natural wastage, there will be some redeployment." In this environment he has found curriculum development not easy to encourage. "We have to convince people that curriculum development equals job satisfaction, not that curriculum development equals promotion." In the face of these sorts of difficulties he is looking for teachers to undertake INSET and then to become catalysts for change. "Yes, ...increasingly my strategy. For instance in our pastoral care course, we asked schools to nominate two people....they are going to attend this six day course and then hopefully from then onwards will act as catalysts....I can see us going a slightly different way in CAL geography, in that with Paul Gomer, he can to a certain extent be the catalyst...he can be a form of service support."

In curriculum development, he also mentions the critical potential role of the recently established curriculum development centre (opened that week!). "We put the teachers centre, resource centre, computer centre and music centre all together on one site as a curriculum development centre." This new venture has been very much a central part of Tom's responsibilities.

Another of his strategies for curriculum development is to get teachers who have undertaken the MA (at the Institute) or attended a DES course, to share their experience. "What I'm going to do is during head of departments meetings, to get these characters feedback their course." He has begun to develop a variety of initiatives not least through a 'planning group' consisting of about 12 heads of department who expressed an interest in being on it. That has led to setting up a sixth form conference for October, 1984; and a five-day course in Durham at Easter for history, geography, economics and sociology sixth formers and some teachers. He admits that not a lot has happened in the LEA over the last year in CAL geography, except at school 1E since Paul Gomer is there, "...who is not only able to write, adapt and adopt and that latter function has been very important." "The big problem is still the quality of the software...it's getting better, quicker....it's a matter of getting access to the machines. A lot of heads of departments still see that as a problem...they still complain it's on the third floor and they happen to be on the first floor." Teachers are still not clear as to how they might use micros in classrooms. "I think we need to get more examples..videos for instance.(He has already video'd a history teacher...he would like to do so for a geography classroom) There is still a

fear of the machine. Some of the programs are still not user friendly, though again that's improving and of course if you get one failure, it takes an awful long time to bounce back." He does not seem very aware of programs that have been recently produced, yet does intend to have CAL as an option on his one day head of department course.

20/12/1984

By this meeting Tom had set up Martin Moseley as convenor/chairperson of the geography and IT group in the Borough, partly because Tom sees it as a way of ensuring Martin gets an advisory position in the future.(at this time, Martin had just failed to get the advisers position in Redbridge and Tom was thinking of Martin's professional development.) Six years on Martin is still looking for an advisory position.

The curriculum development centre had been open for a year and had proved popular with teachers. The sixth formers' geography conference had been successfully held and the precedent established. All schools, bar one, had been represented and ten workshops organised. The video of the use of CAL in a history classroom had been completed and was being used as an INSET resource. CAL had been one of the priorities set up by the head of departments group and there was an intention to invite Rosemary Walton, an ILEA advisory teacher, to address the group (which she did in January, 1985.).

During the school year, 1983/4 the LEA had established networks in each of the Borough's 22 secondary schools, a direct result of the Assistant Director of Education, who Tom sees as the driving force behind IT developments.

Staff redeployment has particularly hit geography and a good deal of Tom's time over the last year has been spent on redeployment interviews. Five geography staff have been redeployed over the last year and further pressure has been put on geography staffing because there has been a slight but noticeable reduction in demand for geography courses to do with current vocational/technological emphases in spite of the success of the 16-19 A level syllabus.

A key management strategy, adopted by Tom, has been the targetting of heads of department, and to support that strategy he ran a full, one day course for them in summer 1984 on management, TVEI, and CPVE.

Overall CAL geography had been a relatively low priority for Tom, in the face of many other competing demands on his time. He hopes the CAL geography group will really get off the ground when the new advisory teacher takes up his post.

Post Script

Prior to coming to LEA 1, as inspector for the humanities, he was an advisory teacher in South Tyneside where he was considerably involved with computers. He shared the responsibility for educational computing with two other advisers, had undertaken a number of CAL geography initiatives and had close links with the regional centre of the MEP in Newcastle. One wonders if that involvement in IT was an influential factor in his getting the position in LEA1?

Once at LEA1 he set up a range of initiatives to support geography teachers there, and these included CAL. He identified heads of departments as the key to curriculum development and in particular a sub-group of those heads who acted as a steering committee for initiatives. Quite soon he identified 'leaders' of CAL geography developments and in particular Martin Moseley supported by Paul Gomer, the IT adviser. However I sense that quite soon the curriculum development initiatives for geography became a lower priority for him as other pressures began

to be felt. these were particularly; setting up the curriculum development centre; the redeployment of teachers; the LEA TVEI initiative; and increasing general inspection demands. As a part of this, CAL geography lost momentum and by the 1984 interview, he was beginning to sound guilty about lack of progress and began to look for excuses.

Since then, Tom in 1988 and 1989, has helped NCET run national level INSET courses for advisory teachers and thus must be highly rated by them.(for instance he was course tutor on a three day residential course for ESG advisory teachers held at the Institute of Education in September, 1989.) Finally in the Autumn of 1990 he moved to an adjoining London Borough where he gained a senior inspector's position.

Portrait of Paul Gomer

Paul Gomer, Inspector for Computer Ed Tech. LEA 1, 20/12/84

Paul started in January, 1984 as advisory teacher for computing and within a year had been made Inspector. This job is, "specifically technology and computer education.....not computer studies, that is an aspect of computer education....I've defined four areas of the use of computers in secondary schools....the four areas being control, computer studies, wordprocessing and CAL." This view he has developed ever since his first teaching job about twelve years ago. He had read physics at university, then went into an American electronics company but then without any teacher training became a maths teacher, then became a science teacher in school 1D. After seven years there, he became head of physics at school 1E. At that school he was then given a new department called computer education. At the same time, he was doing an unofficial advisory teacher job for the Borough concentrating on, "In-service education and going to schools...so it was a bit of both, really....go to a school to help them with their problems."

He has been the key influence in developing an LEA policy on computing. A central priority has been the primary level. "We've identified four areas which they must go for. They must use wordprocessing....a logical low programming range like Logo.....a database.....and first hand simulation. And every child at the end of primary age should experience those four." The LEA went for primary first because, "Secondary's in a mess, and it will stay in a mess until we've actually got something sensible feeding into secondary."

He points out that educational computing is seen as a major priority for the LEA and this goes back to a few years ago when one particular supporter was influential, "...there was a small gang of about five people who had bees in their bonnets and pushed. One of them was the person who's now the principal Assistant Director of Education and he is definitely responsible for the fact that we got started. Since then he still gives us a great deal of active support...in fact we've got active support at all levels.....I've got to the point where I've at least six of my colleague inspectors pushing me to assist them in their curriculum areas, which is exactly what it should be."

Paul's former position as advisory teacher for educational computing has now been taken by a head of technology, then on a senior teachers scale, at a local school. (Arthur Sterling) Their interests complement one another. Arthur is, "very much more interested in software. I'm very much more interested in staff, in-service, so it's that sort of balance."

An important explanation for Paul's sophistication may be to do with his involvement in IT beyond the boundaries of LEA 1. "So my job means I have to be the coordinator of SATRO(Science and technology Regional Organisation, an organisation which promotes liaison between industry and education)...as part of my job also, I carry the label of the MEP Electronics Domain Coordinator for the Capital Region." He is a member of various national level committees. "...there's an RML advisors group(RML is the computer company and there are meetings in Oxford)....the HMI/DES Computer Education Advisors Group, that sort of thing." He feels his thinking about policy has developed through both intra- borough contacts as well as through wider contacts. LEA 1 is fortunate, he argues, in having nearby experts to whom he can turn for advice. "Down here we're lucky...we've got Mike Sharp in Kent...Paul McGee in Croydon...Brian Weaver and Derek Esterson plus a good support staff in ILEA...we've got our centre here. So we have an awful lot of expertise in this particular area ." He argues that there are probably 40 or so

leading individuals/innovators in IT across the country and he feels there is quite a concentration in his area of the country. Certainly he 'networks' and feeds on these local/regional contacts. In particular, "our relations with Capital Region now are excellent, absolutely superb." However he argues that, "...the greatest successes of the MEP aren't on the local level and never have been...the greatest successes of the MEP are nationally....the major achievement as far as I am concerned is in terms of its national image...what its done for the country as a whole simply by being there ie. in terms of general awareness."

His links with Mr David are clearly strong and he gains a good deal of his knowledge about modern geography from him. "I was chatting to Tom (David) before about GYSL and how many schools have got on the bandwagon for that now and he said 'about 13'. That surprised me, I didn't realise we'd got that far. GYSL is a new philosophy...it's a different way to teach geography. That new philosophy, to my mind, makes the use of the computer more feasible." He sees himself serving and reacting to the needs of Tom David the geography inspector. "I've no intention of doing anything about CAL in geography at all, but I will operate the support service to Tom David." "I now only contact geographers through their subject inspector. I only had contact with one geographer and that was Saul Jacobs and I know everything about geography from him." If he sees a piece of software in geography he buys it, then puts it through his 'stage one' evaluation which is a technical evaluation....does it work?...is it motivating?...are there sensible key structures in it?....does it have support material before and after?....so we've got a fairly comprehensive list." If it fails on these and other criteria he throws it away. Otherwise, he tells Tom David about it for the use by geographers in the Borough. "We are in the process of buying any piece of software which runs on our equipment."

Early on in the late nineteen seventies, this LEA made a decision to go for RML as their major supplier of microcomputers. Also by 1984 every secondary school in the LEA had a minimum 8-station network (a good deal earlier than many LEA's). His belief is that the future of IT in secondary schools is with networks but for primary schools it is with a single micro in each class. He feels that as a small LEA they have done quite well with hardware but less so with software because of its cost. "We like to think that we've gone a long way....in the production of guideline supplements. I will not produce a set of computer guidelines or computer education guidelines but I will produce supplements to humanities guidelines on computer education which I think is far more valuable."

Given his wide knowledge of educational computing beyond his LEA's boundaries. I asked him which he felt were the most progressive authorities with respect to computer policy. "Staffordshire, Hertfordshire, ILEA and here. Bexley is in the Dark Ages; Kent is evolving a really weird one(policy); Croydon is in a different ball game; little places like Devon and Cornwall, they've never even started; Avon is strange to say the least, they just think the answer is hardware and mixed hardware too...they don't seem to care what they buy, as long as you buy plenty of it."

Through a former colleague at school 1E he had heard about LEA 3 as far as educational computing was concerned; "...they had one 380Z and they didn't know what to do with it....there's no computing inspector, no computer advisor as such, or at least if there is, they have no effect on that school (where his friend went)....he feels that he doesn't have in-service support there as an individual teacher." (He is now back in school 1E as a Senior Teacher). There is an element of self-satisfaction

in some of this. For instance when Paul is talking of the recent appointment of Arthur Sterling as advisory teacher i/c computing, "...he was up against what was considered to be very stiff opposition, but at interview he was streets ahead of them all." He admits, "...the calibre of staff we train or those that we develop with us must be an indication of our success...and the only thing we can say about that, with very few exceptions, we're a thoroughly incestuous authority." Again in speaking about his own appointment as inspector i/c educational computing, he was rather scathing about the opposition he had to face, "The calibre of people who were applying, you've got to take this as a national picture of what is going on, and it's pretty depressing."

Post Script

Here we have an ambitious and very much 'go-getting' type of man who has been a key influence on the development of policy in this LEA over the years. He had an early interest in CAL across the curriculum right from his time in school 1E and has maintained that interest. He made early professional links with Saul Jacobs in school 1E (and thereby with geography) and since joining the advisory service, he has had a close working relationship with Tom David. In fact their careers have followed similar paths and they have both been 'successful' in the sense of progress through the advisers' career structure. In that sense, have they helped one another progress? He has a wide perspective on educational computing, through his involvement at a national level in a number of committees, and at the local level through contact with his equivalents in adjoining LEA's. He has strong and well thought out views on policy but there is undoubtedly a streak of self-satisfaction and even rigidity here.

Appendix 5.12 Theme 1

The School Environment

1A Head + Curricula

(Knowledge of IT/where on his priorities/creates environment for change?)

No feel that head has any views/policy. Hardly mentioned **1A**

No mention of his views/policy

No clear drive or policy . Mentioned parents expect kids to go on using computers after primary school

Beginning by 1985 of the head feeling IT across curriculum is future - abandoned 'A' level computer studies and reduced work of lower school awareness lessons

Local press 'We regard ourselves as being in the forefront in computing developments' - head! Overall head dominated however by a CS perspective!

1B

'He doesn't understand it' - and admits that - he leaves it to Neil - he likes to talk about it - 'We have an 8 station network' - but hopes none will ask what it is. **1C**

New head in '83 'marking time'. Previous head keen on science and technology. Neither head seemed have clear policy/vision **1D**

Head had important role in setting up 480Z network/ colour monitors/hard disc - encouraged money from LEA and in school fund-raising. 1 micro donated by local firm. Got school known as leading user of IT. Computing facilities = very important element of school. Featured in local newspaper report 1982. Paul Gomer much quoted. Was persuaded by Gomer to take more IT across curriculum stance. Head has a great interest in computers. This school is an innovative environment for curriculum development. By '85 falling rolls and decline of morale. 1 geographer may have to go. Keen head but staff have 'innovation fatigue'?

New acting head by 1989 was a geographer so encourages IT in the subject. Previous head saw technical and vocational education as major thrust and IT as a way of marketing the school. Since left, school lost leading edge. Often quoted in local newspaper. Previous head a key influence. **1E**

No mention of head's standpoint except- sees computers as source of status for school. Not keen on curriculum development - head is very isolationist. 'Curriculum Development is still a bit of a dirty word ... and there/s no-one in charge of curriculum development'. Tries to keep Tom David out of his classroom. No feel for IT across curriculum **1F**

No indication of head's policy re IT.

Head 'gives people latitude and there is little direction from the top' Perhaps over influenced by IT co-ordinator? **1G**

1B IT in this school/Policy/Hardware/Software

No apparent constraints re access

No clear policy/vision **1A**

Computer literacy/awareness courses in first second and third years since 1984 New 10 station 480Z network in 1985 but held in maths department and access a problem. In a small room alongside some upgraded BBCs - comment on heads priorities? The deputy head is concerned at piecemeal development of computing. No clear IT across curriculum drive/policy in this school. **1B**

Neil Pope is a key influence on policy

For 1983 lot of micros in this school Micros can be carried easily into the geography room. Series of very popular computer clubs in this school. Few use it outside CS/Neil/Careers teachers therefore at this stage access not a problem. 5 years ago Neil helped establish fourth and fifth year computer awareness courses. Are mature HOD's a blockage in this school? However geography HOD is young!

Begun to work on a policy of motivating/interesting the kids - to then interest the staff. Reckons blockage is - is cost/benefit for staff worth it? **1C**

Good number of micros around school - early network of 480Z's and others.

Now a larger laboratory.

2 PEP computers bought in 1973! Asked head of computers to meet me to find out how to use computers across curriculum (1984) Computing big growth in this school. Early lead lost (Tony feels) Paul Gomer left early on for school **1E**.

Yet they did take part in Domesday Project!

Consistently strong on Computer Studies. **1D**

Computing facilities very important elements of school - made local press 1982
- Gomer much quoted. Policy is clear but no written document. Clear policies
re IT across curriculum fading with time? **1E**

480z network being increased from 8-13 (1983) and several separate 380Zs. 1
lab and 1 480z network. No evident policy for IT . Head of IT- would prefer to
keep micros for computer studies. 'I don't think he wishes to share.' Title is
head of computer studies not head of educational computing which is
significant. Always lots of hardware but computer studies emphasis. **1F**

IT co-ordinator obviously a computer studies man - programming and elitism! **1G**

1C IT Co-ordinator including Computer Studies (Gatekeeper/Facilitator?)

Head of physics in charge of computers - but obviously pressed and not
passing on information of geography programs.
By 1985 that person replaced - new person keen for a range of subjects to
use IT (biologist by background). **1A**

Persons in charge of computers have been mathematicians. Early person in
charge was doing batch processing with 1C in late 70s and 'was one of the
leading lights of the borough .. so we had quite an early lead'.
New postholder keen to help members of staff outside maths but does not
initiate first moves. 'Not the evangelising type'. His predecessor had bought a
copy of CLIMATE but hadn't informed Mr Davies of that. Overall computer
studies perspectives taken by mathematicians. **1B**

Computer studies has own department but little growth of IT across curriculum
in spite of workshops and getting computer studies department out of maths
and computing. By 1985 she has run familiarisation courses, gives out
software to HOD's - but its not used in even maths or science! But Neil feels
the IT co-ordinator is really a computer studies person - she doesn't really go
out of her way to drag people in. **1C**

9 years ago Tom Perch appointed as a physics and electronics teacher. School
became pioneer for new 'A' level electronics and therefore computers brought in.
Neil MacFarlane (Minister of Education) came round to see computer set up
early on. Tom had an eye for PR! Now Tom is deputy head. Now another
physicist in charge of computers. Computer studies courses and lower school IT

awareness courses = dominant priority. CAL equals third priority. 'There is an open invitation to go up to the room to book it'. More open now to other subjects according to Matthew. Clear computer studies emphasis **1D**

Paul Gomer a key influence 'in charge of CAL' - significant term. He informs departments of programs he has purchased. Transfers software from 380Zs to 480Zs. December 1983 became LEA AT. Lack stability in this position since he left - several post holders. By 1989 lady in charge more a computer studies person.

Important early links between Gomer and Jacobs **1E**

Head of RE was unofficially in charge of computers, 'fanatical enthusiast'. Now a member of maths department been made (1983) head of computer studies. Keen to build up 'O' level computer studies at sixth form level.

New head of computer studies has had minimal effect; 'he's not very good at imparting information to the staff'. Found it difficult to comprehend how dim other staff were re computers. New post holder really less interested in IT across curriculum than former head of RE. **1F**

New head of computing been there 1 year and implemented many changes 'Energy and inclination to get things moving'. Developed quickly a network of 480Zs getting rid of 380Zs to departments. Main interest was to get computer studies onto the curriculum- this Martin and other HODs have resisted. Doesn't seem to have time or interest to encourage CAL across the curriculum. Strict gatekeeper stance taken has irritated Martin. Made stand against him at options meeting . A constraint on IT across curriculum movement. **1G**

1D Miscellaneous re School (Morale and anything else)

Still a grammar school 'feel' to this girls school. **1A**

Still a grammar school 'feel' though on new site. **1B**

Voluntary aided mixed comprehensive - Catholic. **1C**

Boys 11-18 comprehensive sharing separate sixth form unit with girl, school 'Probably the most successful comprehensive on this side of borough'

Is oversubscribed and above average share of more able children. 84 no mention of low morale but by 1985 big difference. Fall in rolls. Staff morale a problem.... 2 geography staff to be lost within the year. Staff beginning to weigh up their commitments. Is curriculum development worth it? Demoralisation mentioned by Tony - lots of people applying for jobs. Amalgamating with girls school 1990/91. Quick change round re fortunes. **1D**

11-18 boys school - roll of 1000.

Morale plummeted by 1985 - 1 geographer to go?

Major loss roll by 1989 - Now 780. **1E**

Large 11-18 school regarded as one of most popular and successful in borough. Very strong support from PTA. Status thing. Imminent threat of redeployment within the department therefore lower morale for 3 who could be moved. Great uncertainty.

1985 Sara mentions overall low morale of staff in school ; 'reluctance to take on extra things - massive impact of industrial action'. **1F**

11-18 mixed comprehensive. The 1 purpose built school in LEA. Working class privately owned houses. Middle band of ability - most children. Relatively cheap houses on edge of London. 7 form entry when was supposed to be a 6 form entry. No mention of low staff morale or influence of 'action'. **1G**

Appendix 5.13 Theme 2

The Department

2A Strengths of Department **(number of pupils, status in school)**

Less popular than in boy's school. 1A led by 1B in terms of geography developments? Deputy head a geographer keen on computers. **1A**

Strong department with a considerable tradition. 3 full time members of staff and Mr Davies. 25 (became 40 in '85) a year at 'A' level, 140 at GCSE and do lot better than history or business studies. 'It must be the people, we have always worked together'. No restriction of pupils by ability. **1B**

3 full time geographers and 2 departmental heads. Two thirds opt for it at GCSE. Has become more popular. GYSL/GCSE has helped boost its popularity. By 1985 even stronger 70:30 geography versus history at GCSE level, 15 at 'A' level. **1C**

Feels geography has slipped over last few years (he would say that!) Head keen to build up science and technology. First two years humanities courses have caused geography to suffer. Not enough 'basic' elements of geography - too much history. 3 full time members of department. Popular subject 100 out of 180 in year group for GCSE. 8 'A' level. 2 previous HODs diverted through other responsibilities. Fieldwork a major thrust? **1D**

Well staffed and popular. 3 full time teachers and a deputy head. Most popular GCSE option. Full fieldwork programme, no doubt helps its popularity. Sam Royce took a diploma in educational computing in 1988 just before leaving. Still strong but new team not so au fait with IT? **1E**

Strong department. 4 full timers and 2 part timers. 17 lower sixth, 18 upper sixth. Because of non pushy stance of HOD the department however does not enjoy high status. Lose best students at 'A' level to science. Becomes stronger with new probationers by 1989. **1F**

Division 1 as far as head is concerned. Last year (83) given £1100 BSE and good results and 1 year 'O' level course. 4 full time geography teachers. Large

'O' level small 'A' level numbers. Well equipped department. 3 specialist rooms and average equipment. Strong department. **1G**

2B Staff -

(Stability/Qualifications/Experience)

Little said about staff/rather dismissed/ignored. **1A**

Strong, stable team of staff. **1B**

Nothing mentioned. **1C**

HOD Ken Box very involved in setting up a Field Study Centre in South Wales - Curriculum development therefore taken a back seat? All HODs have taken MA! **1D**

Stable team e.g. second in department on Scale 3. By 1989 new staff - a little less au fait with CAL though Don White did! (My former student who had taken an optional course on IT in the humanities). Don to leave 1991. Sudden loss of stability of previously stable staff. **1E**

Instability to 1989 but stability then on? **1F**

Sally Low very interested in CAL - worked with CALUSG. Many of staff been on CAL courses. Deputy head very keen on computers but for administrative purposes - written commercial and published programs. One heard little of anyone apart from Sally Low in this interview. **1G**

2C Type of geography

(Courses/Progressive?Changes?)

Traditional Cambridge 'A' level. One gets feeling of no change. Moved by 1989 to 16-19 'A' level. **1A**

No idea on this - probably on progressive side. **1B**

Progressive and popular. **1C**

No feel for this - though were considering taking up 16-19 through Matthew. **1D**

Progressive - fieldwork programme and links with initial teacher training (take students on fieldwork and 'tutors' visiting group of PGCE's) Small 'A' level numbers but most modern courses followed. **1E**

Generally old fashioned courses - first three years Young and Lowry books. HOD 'even considers aims and objectives unnecessary and little can be done until this gentleman retires'. Slow move to more progressive curriculum. **1F**

Relatively progressive curriculum. 14-18/GYSL courses. **1G**

2D Outside Links -

(GA (locally and nationally) Networks? Involvement?)

GA Annual Conference. HOD 1A impression given of links with 1B but little elsewhere. Uses local GA - but can't remember details. Scathing re local adviser and fieldwork organised. Can't remember contents of last meeting went to. Limited links with other schools. **1A**

Positive links and views about new LEA adviser. Contrasts favourably with previous post holder. Mentioned unhappy 1982 meeting. Quotes worth mentioning. Has close links with 1A's HOD but clearly quietly critical of her. Aware of MEP and attended annual GA Conferences. Early member of GAPE. Reckons LEA attempts to promote CAL geography unsuccessful because 1982 meeting; poor notice of meetings; and union action. Feels in spite of advisers' efforts that geography departments are still very isolated from one another. **1B**

Is on LEA 'computer group' - devising LEA wide policy. He was main culprit behind disastrous 1982 meeting at TC. Critical of Paul Gomer being overkeen on hardware (he feels). Reckons he is a computer studies person not interested in IT across curriculum. Feels however for a small LEA it is probably one of the most progressive. Knowledge of MEP and involvement with CICP. Only Neil is aware of these agencies. He knows a lot about politics of computers in the Borough and key influences. Feels LEA could be firmer in encouraging CAL. No comment on Mr David except not seen him since disastrous 1982 meeting. Mr. David does not 'even come in to see probationers' but understands the pressure on him re redundancy and redeployment. Other staff other than Neil not involved in LEA. **1C**

Positive re Tom David. Critical of previous post holder. But geography staff do not attend LEA laid on courses! Little contact with other schools. No mention of wider links. Ken is aware of existence of Paul Gomer. He offers possibility of looking at programs. Sees this LEA negatively cf others he has known. Not heard of MEP. No mention of attending GA Conferences. Tony felt LEA should be more directive. Generally limited outside links. **1D**

1982 Tom David provided BBC micro and software 'if you asked'. Remembers 1982 course and attends GYSL Conferences. Saul attends GA conferences . Noted program developments . Heard of MEP but not sure about it- reckons probably through Paul Gomer, in fact 1982 was an MEP course. Reads Educational Computing and TG 'computer page'. Aware therefore of wider developments. Saul heavily involved in LEA initiatives. An 'outward looking' department. **1E**

Limited links with other borough school departments partly because HOD does not pass on information. Sara did attend unfortunate 1982 meeting. Spoke very positively re Tom David and Martin Moseley's work- setting up CAL geography group. Eulogizes about this. 'Brilliant really, that sort of thing must be done, I think. Shown us that other schools have same constraints etc. ' Likes establishment of HOD's meetings once a term. **1F**

Always attended local meetings of LEA origin including unfortunate 1982 meeting. Got to know Mike Bland - software developer and enthusiast and therefore asked Tom David to invite him to an LEA meeting - that did not happen. HOD's meeting for LEA in 1984 he suggested a sort of CAL group. 1985 Ros Wilton came to such a meeting--- successful meeting. Sally Low spoke re the FARM program and agreement re work of the group. Also Arthur Sterling gave a demo. Saul Jacobs and Sara Norris involved in discussion. But next meeting a failure because failure of post and time of industrial action. Very positive re impact of Tom David e.g. active tutorial work and not averse to 'bringing people in' . Clearly Martin is one of Tom David's 'group'. But aware of isolated tradition of LEAs schools. For example bumped into Saul Jacobs on the train the other day and found out about interesting Docklands work he was doing. **1G**

2E Staff as a Team
(Networks/Influential individuals)

No feel of a team at work here at all. **1A**

Yes one has a feeling, no more, that teamwork exists. **1B**

No feel of teamwork - Neil is an isolate? **1C**

No feel for a team. **1D**

Strong on this , one member of department brought in a TV for BBC. All seem interested and willing to have a go. Deputy Head has own BBC at home! With staff changes will this be lost? **1E**

Not a team - tend to act independently. 'Not a cohesive department at all'. However, popular subject because of 'the overall enthusiasm and standard of teaching within the department'. Now Sara working on teamwork. **1F**

No great feel of a team even though Sally given I/C CAL position. **1G**

2F IT knowledge/expertise of staff

Only a deputy head seems interested. 1989 a recent appointment quite keen and attended LEA course. No spread of this knowledge occurring. **1A**

No evidence of other staff having interest or expertise. **1B**

By 1989 Neil had left and his knowledge lost. No feeling of great depth of expertise here. **1C**

Several have been to CAL meetings arranged by LEA in more recent years. No direct impact. **1D**

Goon IT courses a lot - all of them. More recent staff not so knowledgeable? **1E**

Lots of courses attended by staff e.g. spreadsheets. 1987, Domesday Project 1987, 5 day LEA course on MESU pack. Increased knowledge/expertise over recent years. **1F**

Martin and Sally knowledgeable. Rest probably not. **1G**

Appendix 5.14 Theme 3

Head of Department (or Senior Geography Teacher)

3A Professional background/experience/qualifications

Late forties 'camp follower'; Cambridge graduate. Has been a HOD for 11 years. Former school was a grammar school. **1A**

Mr. Davies been at school for 20 years, before that taught in Birmingham for 5 years. Went on a CEDAR course at 1CL as early as 1978. Buys the BBC micro magazine and has ordered programs from it. Early member of GAPE. Doing an evening class at his own school on computer programming. Very professional but a little 'browned off' - 1984/5 MA course was a bonus. Showed energy pursuing this with LEA. Spiritual refreshment of MA course. Became head of sixth form in 1988 - gave up HOD position- retires in 1989! Took part in Borough two and a half day course on CAL in 1989 with Martin Moseley as partner but both soon to be out of it! Loss of expertise- sad. **1B**

Neil Pope is now 1 of 3 deputy heads and former HOD. Well qualified and experienced **1C**

Tony Lichfield has been at school for 19 years, HOD until 9 years ago and is now 'senior housemaster'. 1983/84 on full time MA course - dissertation on field work. Colleague Ken Box now head of humanities and in charge of geography did same in 1980 - dissertation topic about urban trails. Matthew Johnson had become HOD by 1989. Matthew in first year of MA. Change of leadership a problem? **1D**

Saul Jacobs HOD - third year at school. 2 years VSO and 2 previous schools. Has bought own BBC. Became by 1989 senior teacher in charge of sixth form. Later HOD much less au fait with CAL- he then left. **1E**

Sara Norris not HOD at present but by 1989 had become so. Lengthy teaching experience - been 4 years at 1F. Married to a UDE tutor and has 3 sons at 1F therefore highly informed re developments in geography education. She is only one in department to have shown any interest. Regularly attends GA conferences and IGU conferences and took trouble to attend a Kent GA Conference. Martin Bland led sessions - Sara was impressed. HOD has been

at school for nearly 40 years. It was his first teaching post. Sara took over in 1984. **1F**

HOD is i/c geography and humanities. Has taken a full time MA in geography education, dissertation on mixed ability teaching (1983/4). Then 1986/7 compiler of MESU pack. Has been there for 9 years of the school's 10 year life - previously at an independent boys school in west London and HOD of a central London grammar school. Important impact of MA

course - became more optimistic and cheerful - ambition to join advisory service. Less vulnerable to criticism. 'Noticed' by Tom David, became school TVEI coordinator. Informal head of HOD group in Borough. Very experienced **1G**

3B Management Style/Strategy/Personal Qualities/Policy

'I might be described as slightly traditional'. She 'sent' her colleague to local HODs meeting. 'Sends' colleagues to local meetings. Irregular basis of geography department meetings - divided up filing cabinet- only devolvment of responsibility. Hierarchical/bossy strategy? **1A**

Very keen to keep up to date/ has a conscience. Apologises for not having read various CAL publications. Has tried influence colleagues (gently) eg passed round the SC Program booklet - with no success. Encourages young members of staff to move onto HOD positons. Freedom to young staff to innovate yet is fulsome in praise and encouragement for them. While Mr Davies was on sabbatical a junior colleague coped well - a team exercise probably. Has clear ideas (after MA) of what he would like to do with CAL in the department - eg I micro BBC for geographers and purchase of various programs. Therefore create ready access by geography teachers to a micro. In a way despaired about interesting his fellow staff in computers - 'don't bother to send them any informationthere is no point in sending to anyone else in the geography department here because they are not interested'. Managed to get Domesday system into school. Over 12 years tried interest colleagues but unsuccessfully. Probably too soft to ever push anything stongly-too much of a democrat?. **1B**

Though not HOD he is a strong influence . No policy re IT was mentioned. HOD a bit interested . By 1985 Neil had given up trying to persuade his colleagues? An overbearing influence? Arrogant? **1C**

No feel for management strategies. **1D**

Proactive re CAL eg 1982 asked LEA for micro and came to see me in 1983 after an INSET course. Keen for me to visit. Sold BBC 'A' to maths department. Uses 480Z lab with geography programs. Does not think he has influenced colleagues - they are just interested. Doubt that. **1E**

Sara sees sixth form level as 'way in' for her and CAL. Much will depend on future staffing and especially present HOD. Latter not especially powerful - mild mannered gentle person. Staff not consulted by HOD. Tended to just add to sets of books already owned. No great bids for resources from HOD. Sara's main priority is to make an integrated department. 'It's got to happen very slowly and as tactfully as possible.' **1F**

Gave Sally responsibility and Martin is proactive re Tom David the LEA adviser . No obvious policy/strategy comes through. **1G**

3C Knowledge /Attitudes re IT/ Vision

Sketchy knowledge of IT No knowledge of Computer Page/Literature on IT etc. MORPHO and CAPITAL CITIES used but had 'errors'. Saw WEATHER at GA Conference. 'My feeling was that it was not that marvellous.' Sent colleague to local meeting but 'he came back thoroughly disappointed - his reaction was there was nothing there for us.' See various quotes re attitudes on program qualities. 'I play the farm game ... but its a bit limited'. Does not see computers as a motivating force. 'I mean I was just totally inadequate'. (re computers) Feeling that computers are for statistics really. 1985 went to GA conference, more impressed than was in past but not a lot! 'Too facile' for sixth form. Traditionally her ideas have come from the GA. Fixed views, which seem unwavering. Assumptions about statistics and CAL mainly of use for sixth form. **1A**

Had Shepherd et al (famous book) since GA Conference 1981. Considerable knowledge of CAL geography - knows exactly what micros school has. Did not really appeal to him in early days. He was influenced by an earlier geography

colleague on all this. He moved onto a HOD position in 1982. Aware of MEP - unusual . Has clear views re where CAL could go/could be. Wrote letter to me after interview (1983). Spoke to D Walker at GA Conference in 1981. His attitudes general positive but some contradictions . Negative experience of FARM in classroom. Fully aware of constraints on using CAL. Attended very early conference at 1CL in 1978. Role of MA course on increasing his IT interest. Sees role in inspiring greater interest in kids. But even by 1985 quite clear on constraints at work. Has clear views of where it should/policy should be (1989). **1B**

One of earliest to have used computers in geography lessons. 1978 dissertation at a School of Education , forerunner of many similar pieces of work. Also worked as part coordinator of 'A' level programs (CICP) published 1983. Has total knowledge of IT in this school and key influence on IT policy. Gets Educational Computing and can convert some geography programs from cassette to disc. Over optimistic view of IT awareness of undergraduates. Perhaps all his views are over optimistic/unrealistic? Knows about MEP- even critical of its workings- sees it as remote. Feels not enough professional people in CAL area -rely on goodwill, amateurish approach. Attitudes informed and optimistic. Lengthy views on possible future scenarios eg home/school possibilities and data on discs taken home. Has a 56K 380Z lent to him by CICP. Slightly contemptuous (arrogant?) re those not so active in IT eg the careers teacher about only other teacher to use micros. Uses computers a lot for his administration. Sad that after all his efforts he has been unsuccessful. He has detailed views on constraints and opportunities of CAL. **1C**

Reasonably aware of hardware around school. Aware of 1 geography program- similar to Railway Pioneers. Overall attitudes conservative and not well informed eg. feels main use of computers is statistical analysis of geographical data. Ken sees cost a key constraint also time/software. Matthew sees many possibilities and is quite impressed by quality of software. The HOD's here have had quite different attitudes. **1D**

Early interest in computers because at previous school helped to run a computer club. Also impact of Paul Gomer -mutual encouragement. Asked the LEA for a micro in 1981. Been on various computer courses since early 1980's eg. Croydon 1982 -alerted to data bases and their potential. Progressive and informed views. Felt interest/motivation of kids not waned. Saw future in micro labs. 1986/7 MA Course with dissertation on CAL. Has clear views on the possible future. Clear on constraints. By 1985 feels quality of programs has

improved. Positive and involved in LEA advisory support - David and Gomer. Sees key role/power of inspectorate. Real vision re content free software etc. Now helped to run beyond LEA INSET. **1E**

Full knowledge of computing set up in school- detailed knowledge of where hardware is. Aware of the SC folder- has taken it home- knows about DRAINAGE BASIN and G STATS. Aware FARM but critical re its appropriateness for less able. Informed and positively inclined. 'Yes, it's part of their world now and that's why I think it's important.' Sees value of sharing expertise at LEA wide level. Felt her sons' interest in computers might be very important -like another colleague- who also has a husband who uses micros. Sees variety uses of CAL ;'interest and variety in syllabuses; fulfilling cross curricular IT: number crunching.' Constraints -hassle of getting a room/access to network/arranging group work, amount planning. **1F**

Aware of CAL for several years - bought early SC pack - cassette software. GYSL Conference 1982 acquired NELCAL software eg TOURISM which he became aware of. Positive and informed attitudes re CAL. 'Aware of geography's enormous number of programs ... and much better equipped than almost any other subject.' Very clear views as to why 1982 meeting was a failure - 'boring, it really was pretty desperate I think and Neil Pope not very well prepared.' Attends annual GA/GYSL Conferences and MEP Courses based at Kingston. Uncomfortable feeling he is not so informed re CAL!? **1G**

Appendix 5.15 Theme 4
IT and Geography

4A. Level and nature of activity /trend over time

Used MORPHO and farm game with lower school. Other staff do not seem to use computer. More activity by 1989 because 1 member of staff attended an LEA Course - use FRONT PAGE EXTRA . But is only her showing any interest. **1A**

SPITSYM and batch processing and Imperial College. Early on used FARM program. Pre 1982 therefore very early. Encouraged sixth formers in particular. In 1983-4 programs used quite a bit. He (Mr Davies) has been active but no one else. Will come to a fullstop from now on? **1B**

He used DEMOG with third year, FARM and MILL with first year, ROUTE with fifth year and WINDS with first and sixth years. Has purchased and hopes to use MALTHUS/URBAN GROWTH/PUDDLE. In spite of his efforts in running workshops no other department uses IT. Other staff do not use it. **1C**

To his knowledge (Tony) no one used a computer even though there is a 380Z in geography store room - it appeared in 1983. They had a young New Zealand teacher for one and a half terms last year who made a list of programs held by the LEA - subsequently gone to set up a computer department elsewhere. Still little activity by 1989 even though hardware and software very much available. Yes a bit; FRONT PAGE EXTRA, GRASS, a British Gas program, 2 BBC earth science programs. Beginnings of movement recently. **1D**

As active as any department - maths then geography and computer awareness. Also have used it in fieldwork for several years- one pupil devised a program to portray data in pie charts. By 1989 Saul a senior teacher- using NEWSPA to produce a newsletter. Since 1985 lot more use of content free software - GRASS and FRONT PAGE EXTRA and borrowed LEA Domesday System. He plays down the amount of use. 'We all use computers occasionally.' **1E**

Computer studies main users of IT and maths who run computer club. Economists occasionally and then only Sara from geography. She has used CAL mainly for sixth form level - especially DEMOG. By 1989 department had its own BBC micro. Now have MESU packs. 'Quite bit of software used across

the years.' FARM GAME first year, DRAINAGE/MORPHO lower sixth, RICE FARMING second year, GRASS range of years. Increasing use very slowly. Probationers much more willing to experiment, teach group work etc. **1F**

Admits (1984) to not using CAL except for public displays- DEMOG 1 + 2. Use a Farm Game in first year - devised by Sally Low's boy friend. Rhetoric and action do not match in this department! **1G**

4B. IT Resources/access/hardware/software

1983-1985 bought sixth form suite of programs. Has MORPHO and FARM GAME and nothing else. By 1989 has INSET pack because colleagues attended course. **1A**

Bought FARM program and SPITSYM, also DEMOG. Also School's Council programs. By time of his departure in 1989 there was a big range of geography software and he has persuaded head to buy Domesday System. **1B**

1985 Neil transferrring geography programs - new 10 station 480Z network. Overall, well off throughout for hardware anyway. **1C**

A 380Z 'appeared' in 1983 in geography store room. No software purchased. I was asked to put software on a floppy disc for them. 380Z returned by 1985 since not used. By 1989 a networked Nimbus in geography room plus MESU pack and other software. Resources never a problem here. **1D**

Asked LEA for a micro! (1981) - early BBC A - also early Longman programs - on tape eg DEMOG 1 + 2. Then sold micro to maths. Then lots of geography programs on hard disc. By 1985 acquired a BBC micro - 1984 began investing in BBC programs (£100) CITIES, TOURISM, INTRODUCTION TO GEOGRAPHY. By 1989 a substantial amount of software. **1E**

Access to micros not a problem. HOD bought the early School's Council suite of programs because advised to do so by head of religious education. But he has not used them. **1F**

Some problems of access to the network - Sally reckons problem/stymied unless that happens/improves. **1G**

4C. Plans/Policy re IT and Geography

No policy. Would like to see certain types software. At least given some thought to it. 1985 I was asked to lay on a course at ULIE! **1A**

Had plans and incipient policy but no real evidence of it. Guilty so little has taken place. **1B**

Plans/policy comes through Neil but still no clear feel of what they are!. **1C**

No IT across curriculum policy. Matthew by 1989 has plans. Sees real opportunities in use of IT in geography - lists them! My session at ULIE inspired him! Now experiments and has invested in own PC. No plans/policy except for Matthew- he seems to have incipient plans.**1D**

Clear views that lab is the future, therefore sold BBC. Moved to 480Z lab. Used money to buy programs for hard disc. Demonstrates micro at parents evenings / use of pupils. 1984 when noticed better programs available for BBC, moved back to BBC. Persuaded head to give it to them. (won by school) Committed £1000 to purchase software. As time evolved Saul began to see increasingly wordprocessing and administrative strengths of computer. Vision for IT mainly that of Saul Jacobs? Lost when he was promoted? **1E**

No overt policy even by 1989 but clearly will become part of establishing a more progressive department. **1F**

Lots of good intentions and guilty re low level of action! Intends pressurize Tom David and head for extra resources. Sees pedagogic possibilities of CAL. Sally Low in charge of CAL but little effect. Realises Sally is not a crusading type. He is going to take back the responsibility from her. In some ways Martin is more effective at LEA than at school level. **1G**

Appendix 5.16 Theme 5

Beyond the School

5A. LEA

She sent a colleague to a meeting of HODs (1983) and about computers ' and he came back thoroughly disappointed... his reaction was there was nothing there for us'. Most contact is with neighbouring school's geography department. Does attend lectures at local GA for sixth formers- memory is vague and inaccurate. Scathing about fieldtrip organised by local adviser. Vague about content of HOD's meetings . Meetings are held ' in the middle of nowhere... he has these meetings 2 or 3 times a year'. Does not have lot of time for work of local adviser - unaware of LEA policy re IT or role of adviser for IT or views of director of education. She tends 'send' teachers to geography meetings. Limited contact with other teachers apart from Mr Davies. 'I do not think to be frank that I gain anything from the set up of an area adviser' . But there is a grudging admission of what LEA lays on. ' Well probably in fact since Mr David came there's more done here than any authority I have been in' (Taught in Birmingham , Warwickshire, Lancashire). **1A**

1994/5 supported by LEA 1 to undertake an MA. Positive re new adviser. 'He has been very good as our new inspector... and there have been several useful meetings organised by him'. Not aware of work of Paul Gomer or views of Director of Education. Even he was negative about course run by Neil Pope. Very limited contact with other geography teachers in Borough. Disastrous meeting, ' certainly put off a large number of the ... you might say waverers. I do not think they would have bothered then' . Second meeting almost as disastrous because of Borough post - six HODs only and union action. 'As far as the computing is concerned it's further ahead than many (other LEAs) ... and since Mr David has been in charge we have had quite an encouraging situation'. Bemoans isolation of schools. He does see the LEA idea of getting teachers together to evaluate software as a major way forward. Took part February and July 1989 in two and a half days INSET - observe a colleague using micro - did so with Martin Moseley (but to retire December 1989).**1B**

Neil is part of a recently established computer studies group - major (leader) of disastrous 1982 meeting at TC. He mentions ' first lot of MEP packs arrived, I was then asked to demonstrate it to people..... and I was assured that it all had high resolution graphics and various things, and it did not'. He feels Paul

Gomer is a computer studies person'. I must say that Borough 1 is probably one of the most progressive for a smaller Borough... there's a lot wrong with it in other things. No mention of borough policy or role of Director of Education. 'Well LEA 1 has always been at the forefront of computers and it runs a very big computer gathering and there's a computer education committee and various other things... its always been at the forefront'. Critical role of a former science and maths inspector. 'The deputy director of education at the moment used to be the former science and maths inspector... was a very forceful character and he pushed it so that at the early stages, it got off the ground'. He appears to be both an influential man and not a man to cross. "Oh yes, very dangerous. He will favour some people and put money into what he wants and that's how it's developed'. He feels there needs to be a stronger directive from LEA. He was directly critical of Paul Gomer and his lack of encouragement of CAL across the curriculum. ' He is doing very little computers at the moment... he is pursuing technology... in CAL he has had very little impact- but big impact on developing hardware policy 'He is a computer man first. Bit negative about Mr David - 50% of their time (of Inspectors) is spent on redundancy and redeployment'. Because of borough policy has an 8 station 480Z network. Feels school has become a touch neglected by LEA and under-resourced. Has a view that resources not forthcoming because 'we defeated the education chairman over school transport... we are out on a limb geographically and out of favour ever since.' **1C**

Positive view of Mr David 'He's very nice. I wish we had had him 6 or 7 years ago'. They had an English inspector - not liked(responsible for humanities). No mention made of AT for IT, Paul Gomer or LEA policy re computers. Yet in spite of complimentary comments re new humanities adviser, geography staff do not attend courses. Only present HOD Matthew Johnson went on the November 1982 course. It has no impact. Few links with other schools. By 1985 several of department had attended some LEA organised CAL geography meetings because a new CAL geography working group had been set up by Martin Moseley. Remembers (Ken) unfortunate meeting in 1982 wrong time/not enough time or publicity and low priority. He sees key constraint as cost of software. Sees advantages of Paul Gomer's appointment - useful bank of programs and expertise (long quote). Sees LEA 1 as between LEA (good) and Kent (bad). Sees major weakness as limited release for staff to attend INSET during day. Tony had detailed criticisms of Mr. David. Not in schools enough, not as much personal contact, not enough direction from him (compares him unfavourably with previous adviser). As far as LEA is

concerned he approved of establishment of CDC but felt 'there was a general lack of resources provided.' **1D**

Local humanities adviser provided the department with a micro in 1982. Saul Jacobs reckoned LEA was prepared to buy software if you asked. He remembers the unsuccessful 1982 course- better programs needed high resolution graphics and that was not available - so only older stuff demonstrated. ' It was the most uninspiring stuff'. At this time no AT for IT or written up policy document from LEA. No mention made of view/ stance of Director of Education. Mentions (in 1985 interview) local CAL geography group set up by Mr David and Martin Moseley eg Teachers Centre meeting in early 1984. All to do with evaluating software and pooling experience. 1984 meeting attended by half secondary schools. Positive to Mr David re CAL geography group. HOD's meet once a term but he does not see Mr David when he comes into school ie. does not come into geography department . Not happy re this but does realise he has big work load re re-deployment. Feels LEA is especially fortunate to have 2 senior inspectors (David and Gomer) working together having a firm commitment and experience in IT across the curriculum. Inspector level not CEO level that has led to curriculum initiatives in this LEA - such inspectors have power (through resources) and willingness to support initiatives eg buying Learning Geography with Computers pack for every department plus associated INSET. " This support for new initiatives from the inspectorate plus keenness to take things on was because LEA 1 wishes to be seen at the leading edge of new curriculum initiatives ". Applauds Tom David 'always very supportive in the background' and way he gave up time and resources to set up geography CAL users group. However by 1989 it had died a death. Positive re Tom David's arrangement of secondment for himself, Davies, Moseley and Lichfield. No other teachers in borough had influenced him other than Paul Gomer (a former colleague) and Neil Pope. **1E**

In 1983 interview no mention made of impacts of LEA advisers or CEO. Present HOD acts as a barrier to information getting through about LEA activities. Does remember unfortunate CAL geography meeting of 1982 -software/hardware not compatible and limited number of programs seen-one member of department has been on an elementary computer awareness course. Delighted at establishment of CAL geography group (David and Moseley). ' I think its an excellent idea. It was very good initially to get together and find out that all schools in the borough have similar problems of access to computers - computer studies and maths departments hogging it'. Regular meetings of CAL geography group -'Brilliant really. That sort of thing must be

done! A morale booster in terms of persisting really'. The LEA was prepared to purchase software that teachers wanted and then it could be borrowed from the Teachers' Centre. Sara is critical of own school and LEA when it comes to support for curriculum development but then thinks it could be her isolationist head. Sees Mr David as 'very supportive and is, very active but the borough as a whole is not.' Termly HOD meetings are 'a tremendous source of information and progress really'. But her head keeps him away from classrooms and department when he visits. Sees Paul Gomer as someone who helps to acquire computers - no more. Various courses 1985-89 have been attended by geography staff - all LEA laid on. **1F**

Remembers November 1982 unhappy meeting 'Oh it was so boring , it was incredibly boring' one screen and micro. 'It really was pretty desperate, I think I wrote to Mr David to see if Martin Bland could be invited to Borough someone who was keen on CAL in his Kent school. Back to unhappy meeting-'I think Neil Pope really was just not very well prepared, and I think trying to run a meeting in that style is courting disaster'. He reckoned LEA had been set back by such an unsuccessful event. Then starting from Autumn 1994 a CAL group set up. He describes this in detail. Martin a key figure - coordinator. Clearly strong link between him and Mr David established. At first CAL geography HODs meeting, Martin 'engineered' it a bit eg questions to Saul Jacobs and Sara Norris. He compares Tom David very favourably with previous post - holder -- regular HOD's meetings ; sixth form courses. 'He's not starchy'. But his job is not easy because there is a long established tradition of LEA 1's schools working in isolation. **1G**

5B National Developments

'I have seen the WEATHER one at the GA Annual Conference '. Asked re information about programs, she could not remember any. 'No my mind is blank on the issue' (through she does get the TES and TG) Seems unaffected by national level developments on IT and geography. Unaware of MEP, literature on IT, TG Computer Page or literature on IT geography. Traditionally her 'curriculum development and ideas have come from the GA.' **1A**

Aware of MEP but not of its substance. Regular attender of GA conference and CAL workshops and early member of GAPE. Also 1978 course attended at ICL. Bought and read 'CAL in Geography' at GA conference in 1981. 1984/5 MA course had taken him out of 'an unfortunate rut..... it has given me a great deal

of spiritual refreshment I do value greatly the way in which it has opened up doors and got me out in various directions.' **1B**

Knows of and has worked with MEP and has a view on its weaknesses. Big influence of his MA research, his reading in his work for the Computers in the Curriculum Project. 'I think MEP has done well. I think they have achieved their object of getting hardware into schools'. On the other hand he was critical of their courses held at Kingston, Croydon and Kennington. Also the courses are during day and there is no supply cover. Lots want to go on computer courses. 'The demand is still there but it's getting there and the cost of supply cover.' He is in charge of staff development. **1C**

Wider influences have not had an impact. Not heard of MEP. By 1989 had acquired MESU pack. Matthew Johnson, 'I have just completed 1 year of the MA Course and I benefited enormously from your sessions on IT. It gave me the impetus to experiment at school and also to invest in my own PC.... I feel that the whole ethos of computer education has changed - there are now much better programs on the market for geography.' 3 geographers undertook an MA, since 1980 but limited action re CAL and geography. **1D**

Saul Jacobs attends major conferences eg GA Conference and GYSL National Conference. Saw some programs at the latter and was impressed. Not aware so much of MEP though he attended an April 1982 course in Croydon which was an MEP course! Reads both Educational Computing and the Computer Page of TG. Quite aware of latest programs "some of them are beginning to take greater advantage of the computer's real abilities to speed things up or present things in a more dynamic way than a picture can." He reads the software reviews in TG. As a geography department they regularly attend INSET on CAL eg 1 day course at a university school of education in 1984. They are collecting data for Domesday Project. Helped run INSET courses at a local school of education and Cambridgeshire in 1989. **1E**

Not heard of MEP but each year monitors software at annual GA conference. Also attended a conference laid on by Kent GA. In 1985 she wonders if her interest in CAL was partly to do with having a university tutor in geography education as a husband and three boys interested in computers. 'The more I think about the question, the more it is that it's only two of us who are interested that have got husbands who use micros and children who use micros and the other three (geography staff) are not interested and have no contact outside school. **1F**

He and his department have attended annual GA and GYSL Conferences and MEP was mentioned as a provider of a 3 day course at Kingston. Attended an MA geography education course full time 1983/4 so read everything about CAL geography - this led him to approach Tom David about getting a group together - a CAL geography group! 'I think it's important to have a wider view, so that one can see CAL geography in a wider educational context.

The MA made him' more optimistic and cheerful' with the ambition to move to the advisory service. Before 'people had undermined my confidence' . Later became AT then adviser and compiler of Learning Geography with Computers Pack at ULIE 1986/7. **1G**

Appendix 5.17 Themes from Portrait of Tom David

(Based on interviews
22/12/82; 20/2/83; 20/12/84)

Background/Career Path

August 1982 arrived at LEA1. Prior to that was advisory teacher (Humanities) in South Tyneside.
Summer 1990 gains promotion (Chief Inspector) to Croydon.
1983/84 good deal of time on redeployment of teachers.
Sets up Curriculum Development Centre(CDC) in December 1983.
September 1989 Tom David is co-course director of NCET course at University of London (ULIE): highly respected by NCET.

Initiatives/Policy to Do With Geography

Had no ideas as to how often geography teachers met in the borough before he arrived. Had a key early meeting with HODs in 1982 (Autumn). Set up 3 working groups on 1) Teachers Conference 2) 6th Formers Conference 3) Resources. His strategy is to work through HoDs

Late 1983 in process closing 1 secondary school. Need to lose 60 teachers in 1984. Because low morale has to convince teachers that curriculum development (CD) is worthwhile. Increasingly his strategy is to identify key people as catalysts for change and CD. CDC is teachers centre, resource centre and music centre. Warden about to retire. He has eyes on Martin Moseley as replacement. Role of seconded teachers - particularly MAs - sees choice of dissertation topic as important. Then need to feedback to rest of HoDs e.g. Tony Lichfield and fieldwork. Encourages local GA - sessions on 'A' level topics. Has identified a 'planning' group of HoDs (12 out of 23). 1 day HoDs course in summer 1984. Also a course in Durham for 'A' level students and teachers. In 1984 seems very pleased with success of CD Centre. 'Car park chocca every night'. 4 inspectors now based there including computing inspector and an advisory teacher. He has had to redeploy 5 geography staff in 1984. Summer day course of HoDs (1984) am. Management; pm TVEI/CPVE. Strategy is for 12 HoDs to act as planning group then working group. Martin Moseley as chair of HoDs group. Tom David tends not to attend.

Impact on CAL Geography

Throughout 1980s works closely with AT who becomes Inspector for computer education (Paul Gomer). Arranged for 'circus' of MEP software to be viewed Nov/Dec 1992. Problematic meeting on Nov 24 '82. Big problem seemed 45 minute demonstration by Neil Pope of TRADEWINDS - teachers encouraged to subsequently look at programs - none did! David seems one of few inspectors keen on CAL and liaising with computer inspector. Very aware of leaders in CAL geography in borough - narrowing down to School IE (Saul Jacobs) and links with Paul Gomer former teacher there. Wants to video a geography CAL lesson. Realises he needs focus on particular programs with a teacher catalyst. Is to run CAL as an option in his 1 day HOD course. In 1984 has identified Martin Moseley (MM) as chair of geography and IT group - with Saul Jacobs and Mike Hobbes. Sees himself as a patron, of MM. Needed to chair group for 'his own professional development'. By 1984 CAL geography less a priority because of time spent on CDC and redeployment plus inspections. Hoping HODs group and CAL geography group will run themselves. 'There are people like Saul, like Martin, like Mike Hobbes who I can see as being quite a useful little node, with a writer and some teachers' (20/12/83).

Views on CAL Geography (e.g. vision, constraints, MEP)

Influenced by experiences in northern England - had set up courses, geography user group there. Reckoned local MEP region less effective than region he was used to but early assessment (8 weeks in !) and more involved with MEP in northern England. Sees MEP as overmuch computer studies. Reckoned 'circus' of MEP programs was not attended because of poor publicity. - blames himself. Constraints on change - time plus contact ratios rising plus low morale - also quality of software plus access to machines. Lack examples of good practice therefore need for a video. End 1983 is he really that aware of what programs on offer? Sees Assistant Director of Education as 'driving force behind IT'. Geography in borough hit badly by redeployment. By late 1984 I sense CAL Geography is less of a priority?

Appendix 5.18 Themes from Portrait of Paul Gomer

(Based on interview 20/12/84 plus comments by Tom David/Martin Moseley)

Background/Career Path

January 1984 made advisory teacher(AT) i/c computing. Then December 1984 Inspector for Computer Educational Technology. Read physics at university. Worked for a US electronics company. Soon dissatisfied so began teach maths with no PGCE. Spent seven and a half years at school ID teaching maths and sciences then introducing computer education. Went then to head of physics at school IE. There he became head of a new department, computer education. For four and a half years also out of school as unofficial advisory teacher.

January 1985 Arthur Sterling to be AT computer education. As Inspector he focuses on staff and INSET, Arthur on software. Paul is also MEP Electronics Domain Coordinator for local MEP region.

He is also on MEP Advisers Group and other national level groups. To get his inspector position there was a national level advert - he reckons quality of applicants was indifferent.

Initiatives/Policy

Defined 4 areas of use of computers in secondary schools: control: computer studies; word processing; CAL. Key early policy was to focus on primary. What happens is that he informs Tom David of what is available (Software). His local MEP region a touch ostracised because they crossed Assistant Director of Education who is powerful! Sees himself as a 'support service to Tom David'. He would like to be out of a job in 5 years time. He buys software that gets through his 'stage 1 evaluation'. Stage 2 evaluation is undertaken by subject inspectors. He buys everything that runs on RMLs! Key decision was taken in 1977 to become an RML authority. Feels LEA 1 has done well for hardware and advisory staffing but poor re-software purchase.

Impact on CAL Geography

Reasonable awareness of programs (not detailed). If software runs on RMLs he buys it and informs Tom David. Acted as support for Tom David. Aware of GYSL and impact on pedagogy. Late 1984 has bought around 30 pieces geography software. Main contact with geography teachers is through Saul Jacobs. Really interacts with them through Tom David so is in fact distant from them.

Views

Has a lot! Would like to work himself out of a job. Has good links with Bill Tagg, Derek Esterson, Bryan Weaver through MEP (Rather famous names within educational computing and MEP). Is positive about MEP's national image. 'Our relations with our local MEP region now are excellent, absolutely superb'. It has offered him an immediate information service' and a range of INSET courses for his teachers - He is very positive BUT evaluation not sufficiently built into system. Quite critical of lot of software. Helped steer the LEA to have 8 station networks in every school by 1984. This is the the future for secondary he thinks. Reckons LEA1 has been strong on hardware and staffing but weak on software. Very positive re LEA 1's position nationally - particularly re guideline statements. Sees Staffordshire, Hertfordshire, ILEA and LEA 1 as most progressive LEAs re computer education.

He is negative about LEA 2 - lack of computer advisers, inservice support etc. Agrees that MEP is most useful/successful when LEA is knowledgeable and demanding.

Clearly a wide perspective and the big influence on this LEA's computer education directions. Does seem to have created a relatively progressive LEA in the field of computer education.

Appendix 7.1 Portrait of School 2A

School 2A 5/3/84

Background

School 2A is a mixed 11-18 comprehensive with a small sixth form shared in a 'collegiate' system with other local schools. It has recently experienced a drop in intake from 8 to 6 form entry.

Interviewee

Anton has been at the school for many years and is head of geography. He is a calm and humourous man with a great commitment to music, particularly singing, outside of the school. His knowledge and experience of computers is limited, though he has "seen some (software) in the Cambridge catalogue." He went to an HMI course on 'Geography for the '80's' at Bognor Regis about two years ago and he gained, "a folder with games in it" (apparently publicity information about software)) but has clearly not used or indeed looked at it. "I haven't actually seen any running to be perfectly honest....I still haven't sorted out as to how to use a computer in the classroom when you've only got one for example." He is aware of Jack Wright of the local polytechnic who has an interest in computers but has not had any contact with him. As to the advantages of the use of computers in geography, "I see it as another resource in the way video and film has come into the classroom...taking 'em away from written work especially with lower band children." "Constraints are the lack of experience on my own part and within the department in general.....the numbers of computers available, I'm worried about that....how do you give adequate time to people (here he means the children) to have any meaning for them...and that inevitably comes down to money."

He has a Sinclair Spectrum at home and he has seen the impact on his little boy (which has been positive). His son has played chess and various games as well as programming a colour chart. He bought it just before Christmas and admits that, "I am hopeless on the games." His views on the use of computers in geography are varied and not especially consistent. On the one hand he agrees that, 'There are

too many problems involved in the use of computers in geography teaching' and 'There is limited educational value in using CAL for geography teaching' and agrees strongly that 'Until more micros are available to teachers, there is little point in using CAL in geography lessons', yet on the other hand he agrees that, 'CAL can help childrens' learning by simplifying the real world in computer games and simulations', 'CAL can help to motivate pupils in geography lessons' and 'CAL can help children handle a range of variables in a problem solving situation.' He furthermore realises that there is more to CAL than handling data or statistical analysis and disagrees that, 'There is little help or information available about using the computer in geography teaching' or that, 'In the present world of 'cuts' CAL and geography should take a very low priority'. These present a mixture of attitudes and awareness. He reckons the information about CAL geography is available "if we could get over the psychological barrier of resistance to it."

Geography Department

There are five members of staff in the geography department including Anton. Geography seems however to be getting less popular about which Anton is fully aware but seems to have accepted. "The head keeps saying geography is a minority subject." "Well, I don't know what's happened...we have tried to teach more relevant courses now...perhaps they weren't wanted....more the regional stuff...kids turn round and say 'this is very difficult'" He seems to be accepting it is on a permanently downward swing. When Jack Wright of the local polytechnic was in the school he remarked, "geography is dying" and that was not questioned. Apparently Jack is "keen on computers" and Malcolm, one member of the department, knows him but Anton does not know if he has been shown any CAL.

As to CAL within the department, Malcolm had bought a Weather program and was interested in IT but to Anton's knowledge there has been no use of CAL within the department. The management strategy within the geography department appears to be 'laissez faire' with no policy for IT and geography since it is not seen as a high priority.

The School

A course on computers for members of staff had been run but only Irene (a young former PGCE student of mine) had attended from the geography department and then for only one or two of the sessions. No mention was made of the Head's views on IT though he was keen to have a BBC network of 11 terminals established in the next few months. Bruce, the head of Science, was responsible for computers but had no extra allowance. The present hardware situation is that there are 5 BBC's only one with a double disc drive (the rest have single disc drives). At present these are used only by computer studies groups and an active computer club each afternoon after school. Next year there is to be a computer appreciation course for the first two years of the school and that will be achieved through science lessons over about half a term. Bruce feels the geographers should make use of the network when it arrives and thinks they should develop their own databases. However there is no feeling here of a pro-active set of moves by Bruce to encourage the use of CAL by the geographers. He clearly has enough to do as it is. No IT policy had been developed by the school.

The LEA

The adviser with responsibility for geography is Gail Joplin who has several other subject and wider responsibilities. Her impact on Anton has been limited, but she did in the past help him to acquire blinds and overhead projectors for geography. She has encouraged the local geography teachers group by helping with the duplication of programmes and the availability of a venue to meet. Anton is fully aware of the existence of this group but only Irene in his department is involved in it. Bruce, the head of science and computers is equally aware of the recent appointment of Judy Bloom as an advisory teacher for computers within LEA 2 and based at the Teachers Centre but makes no mention of any contact with her. Overall the advisory service has limited impact on geography or IT in this school. The only contact with other geography teachers is through Irene and her attendance at meetings of the local geography teachers group.

National Picture

Apart from Anton's attendance at an HMI course for geography teachers two or so years ago, there seem to be no wider influences on this department. That includes books, conferences and GA meetings. Neither Anton nor Bruce knew of MEP but Bruce was aware of the local MEP newsletter and that some teachers had been on one day courses. He just did not connect them with the MEP organisation, which does not suggest a great awareness of nationwide IT developments!

School 2A 11/2/85

Within a year the situation had worsened for both school and department. The reorganisation of schools in the borough has been under active debate and one scenario had been the closure of three schools, with this school being one of them. Eventually that had been averted at least temporarily, though the school was now in a falling roll situation. Just over five staff would have to be lost this year and the 'collegiate' system of sharing sixth formers with six other local schools was continuing. This had not worked well according to Anton since keen A level geographers did not feel they were welcomed at the other schools and thus dropped the subject. The geography department had had to lose one member of staff, a young man, who had been redeployed to a local school. Another member of the department had been made head of fifth year and therefore these two changes had made staffing tight and teaching in areas other than in geography had had to be stopped. The number opting for geography in the fourth year had been 90 but the lower bands had not done so since there is still this image that geography is difficult. "History is seen as conventional and easy."

The major threat on the horizon, according to Anton, is the establishment of a new humanities course in direct competition with history and geography. The Head has imposed this development and has not communicated with the staff about it. As Anton cynically remarked, "It's worse than the government....white man speaking with forked tongue." No coordinator for the new course has been appointed though one man has been given the task of compiling the course booklet. Anton has

naturally a worry in all this as to how it may affect the numbers likely to opt for geography in the near future.

In spite of the recent loss of members of staff and threatened closure, Anton claims there is no great unrest in the staff or conversation about changes. It continues to be a stable staff though, "there are a number of people who would like to move."

The geography department now has a BBC micro but no new software has been purchased other than the weather program previously bought by Malcolm. The reason for its 'arrival' in September, 1984 is because of the presence now of a network of TVEI micros making the original BBC's surplus. It is "Locked in the library cupboard here. So far I have been struggling through, in holidays and at weekends with '30 hours BASIC' ...just getting myself familiar...I think we see it largely as an administrative tool at present.....for exam papers and that sort of stuff." Perhaps he is waiting for Malcolm to be the catalyst? "Malcolm has his own BBC at home in order to organise himself....He said let me get experienced and then we will be able to(make more use of it presumably)". Anton also sees the need to get geography pupils into a lab of micros but is fully aware of the access problems of the present set-up. "The theory is we negotiate time over there (TVEI lab) but that is virtually impossible." That is because 50 per cent of the time is taken up by TVEI students and the rest by computer literacy or computer studies courses. Furthermore, he sees no way in which one micro can be used in geography lessons so is looking at their present BBC as simply administrative support. Anton does not see George the new head of computer studies as encouraging IT across the curriculum. Apparently they have taken geography programs to him and he has simply criticized them and has not been impressed by them. He is thus far from a pro-active influence on geography making use of computers.

As to contact with the wider LEA, Anton mentioned Gail the adviser coming in just once during the year to speak to heads of departments about TVEI, "to say very little." The local geography teachers group has lost momentum because Deryn Hartford, the coordinator of the group and head of department of one of the local

schools, has been heavily involved in geography within TVEI in the borough, and has had less time to spend on the group.

The other change within the last year has been the return of Bruce to his head of science position and the appointment of George from September, 1984 as head of computer studies from a school in north London. According to Anton he is "very much a computer studies man". Interestingly enough he helped to develop a fieldwork program when he worked in Somerset though Anton seems unaware of this. The Head sees him as setting up a new department of computer studies but funded by TVEI. The network of 11 BBC's is to be increased to 20 next week. When asked about his views on IT across the curriculum he replied, "I try to encourage them (other staff including geographers) but I don't have the time. I have a full timetable...one free only." He is trying to get extra staff by persuading the Head at a meeting next week. He gets information from the local MEP centre but it tends to get filed not read. He has limited contact with the recently appointed advisory teacher for computer studies, Judy Bloom. He has written to her on a number of occasions but she has not been in contact. "I saw her once at the beginning of the first term." He wonders if she keeps away because she feels he is already knowledgeable about computers. Whatever he is critical of her and is disappointed. His major contacts outside the school are with the equivalent computer people in the two other TVEI schools in the LEA. These contacts are usually by 'phone. He is hoping to share his hopes for the future with the Head at a meeting next week and they include; another member of staff to help him; use of the computers across the departments, including wordprocessing and database developments; use of Prestel; and to develop more software.

School 2A 17/7/89

Since the last interview the school has lost more pupils and there seems to be a doubt as to whether it will survive. Irene, the young and keen former student of mine, is still there but her input has varied since she has had two periods of maternity leave to have two children. Malcolm the teacher who my student teacher

rated as 'innovative' (see my interview with Kate Jackson in 1986) has left to become an adviser for profiling in the LEA. James Right, who with Anton had been in the department longest, has become a part of the school's senior management team and in charge of profiling and therefore teaches much less geography. So the continuity of staff in geography has been lost. Geography's position has been eroded even more than four years ago since now there is no longer an examination class doing geography. They have two A level geography students both taught in other schools. Anton puts the decline down to the establishment of a humanities faculty and the introduction of integrated humanities from 11 to 16. This was achieved by bringing in, three years ago, a 'woman' as Anton put it as head of the faculty and over the heads of history and geography. At 14-16 level, humanities became 'core' and history and geography became optional. The reason for this was a combination of borough-wide policy on humanities led by the powerful and now senior adviser and formerly leader of the Teachers' Centre, Dan Godber as well as the head of school 2A, now retired. According to Anton only two schools, including his own, gave in to that pressure for integrated humanities.

The previous Head did not see eye to eye with either Anton or James. This was confirmed by my interview with the student teacher (Kate Jackson) in 1986 who also felt that Malcolm and the previous Head didn't see eye to eye either. The new Head has made (unofficially as yet) Anton into second in the humanities faculty. Anton is also now more hopeful that geography and history can re-establish themselves in the school since both heads of departments are keen to see separate slots for their subjects on the timetable.

There have been some developments in computers and geography since there is now a powerful Nimbus in the faculty with a Winchester disc! It cost over £3000 and was, according to Anton, given to them as a leaving present by the former Head. Children have been doing wordprocessing on it using NEWSPAPER and the BBC is being used for worksheets in the lower school. There is no subject specific software for the Nimbus and Anton uses it for course materials.

Over the years Anton has become much more interested in computers and in an unguarded moment at the end of the interview said that, "I have enjoyed working with computers...its changed my life." So much so that he is desperate to get onto the diploma course run by Kings College, London but is meeting secondment problems. He has been frustrated by this and was stimulated to mention his qualifications which he felt would have been sufficient, alongside his experience, to gain the release. These include a Cambridge degree, a degree from a local polytechnic, an MSc from Birkbeck College. The reason for this change in attitude appears to be the role of George who gave Anton a good deal of INSET since he saw him as one of the few teachers who had tried to use computers in their teaching. George showed him how to make batch files and Anton has also been on a two- day INSET course with Marlene Southern the new ESG advisory teacher in humanities. Also he has been on the course Marlene ran on the INSET pack, so he has made a good deal of personal progress.

Anton bemoaned the lack of a subject adviser for geography and derisively mentioned (again!) that all Gail ever did for him was "get me some blinds once!" The geography teachers group still meets under the chairmanship of a replacement for Deryn Hartford "but meetings are poorly attended because they are not compulsory." He feels that "the jewels of (this borough) are evaluation and records of achievement " and that IT has not been a high priority. What comes across to him from the LEA are, "general curriculum statements and glossy booklets on evaluation and profiling."

As to support for IT within the borough, Anton was aware of various courses run from the Teachers Centre and indeed had attended a course run at the local FE College about two or three years ago. It was very much computer studies in flavour and included wordprocessing and was coordinated by Paul Edwards, now the Inspector for Computer Studies in the LEA. Marlene Southern helped to deliver the course as well. Apparently they were both working at the local college at the time and have subsequently maintained their professional links. He found it, "interesting

that George went for that job (the ESG advisory teacher job that Marlene got) and didn't get it.....and he knows far, far more about computers than Marlene." He wonders if she got the job through her previous professional links with Paul Edwards. They do seem to share a common link also in their background in computer studies per se.

Anton was not aware of any impact on him of either MEP or its successor MESU, though was naturally aware of the INSET pack. When asked about the former Head's vision about IT he responded, " I don't think he's got a vision of anything, except a packet of crisps!"

In some ways it is sad that the one person who has inspired Anton to be more positively inclined towards IT, that is George, has now left in a disillusioned state of mind. This was because the former Head did not see eye to eye with him over IT across the curriculum. "He kept going to the Head and the Head wouldn't back him." The Head insisted on computer studies on the timetable and George didn't want that. Also George became less powerful as the TVEI money began to dry up. George left the school in the summer of 1985 to take up a D scale position in charge of CAL and IT in a South London school.

Interview with Ellen Foster, PGCE student 1983/4 (13/3/84)

Ellen explained that, "Martin is on a curriculum working party and is very rarely in school now." This is one of Dan Godber's powerful groups which have quite an influence on LEA policy. Irene, Ellen feels, is much overworked with responsibilities for A/V aids, form teacher and so on. Anton has a big interest and involvement in singing and along with the others in the department leaves school right away at the end of afternoon lessons. "None of the geography staff stay till after 3.25pm.....they're off to pursue their own interests." "It doesn't work as a department. They are individuals." There are very few departmental meetings "No there is no teamwork at all...very few meetings.....He is not a good head of department.....very little planning, structure and organisation.....the day very much

ends at 3.25pm.” Anton doesn’t seem to ‘push’ for more resources in the department, consequently it is poorly off. There is “no geography room, just bare classrooms...no blinds.” “Anton doesn’t push for more resources and works within those constraints.”

Ellen paints a depressing picture of a downward spiralling department. “It seems that it’s a dying department.” “Geography as a subject...for exams....it’s non-existent really....it has a low position within the school.” “Science gets the brighter children....geography gets the rest.” It loses out in the choices of options by third years in competition with history which is led by a head of department who has a strong personality. The children in this school, so Ellen argues, are socialised to expect and therefore like formal teaching. History’s syllabus is old fashioned, a/v aids are not used, they get results and are very popular with the children. At option choice time, “It is not made clear to children who or what they would have in geography at 14-16 level.”

On the other hand Ellen is highly complimentary about Anton in various respects. He is, “Very progressive towards geography....keen on radical geography.....I was lucky to be there.” “He is politically aware.....a laid back sort of person.....a man of many facets.” The department made every effort to make Ellen’s stay very pleasant. “They are very supportive.” However Ellen wouldn’t teach there, not least because she would have too much freedom. (there are no syllabus guidelines) “He is an excellent teacher..very good at his subject and very good with the children... it’s just other members of staff he doesn’t get on with.” This refers to the various ‘feuds’ he has with several members of staff not least with the Head! “Anton because of his lack of push....he takes all the blame(from the Head).” “He’s not forceful enough....the (school 2C) lady is too forceful....he’s too laid back about the whole thing.”

Ellen foresees that Humanities could take over geography and geography would be lost.

Interview with Kate Jackson and Alison Wilson, PGCE students 1985/6

They explained that geography had a low status within the school and was becoming less popular now that humanities was in the 14-16 level core. They identified friction between various geography teachers and the Head, not least with Anton and Malcolm. There had been a lack of formal departmental meetings, possibly because of the industrial action. All the geographers get on well together and had lots of informal meetings in the pub! But they, "are not managed very well...not a sense of him being in charge...they all joke about his lackadaisical attitude to work...but they get on with him...he is such a nice man." They see Anton and James as old fashioned and "self satisfied" with Irene and Malcolm being more innovative.

They are aware there is a BBC in the department but don't know where it is. They use it for letters from the school staff association and administration. No obvious interest was shown by Anton or James in Karen's assignment on CAL for the course she was doing at the Institute. "James is bemused by it," she remarked. "Anton and James are well established...don't see the need or reason to take on innovations." "Putting kids into groups....he(James) was not at all positive to it." They had not found innovating in geography classrooms easy in this environment.

Post Script

In my interviews over a five year period, I was struck by the steady decline in the fortunes of geography within this school. Anton though calm and charming is not an innovator or a strong leader of a department. He has lacked drive and has been engaged in a longstanding feud with the Head. Geography is not a department but a group of individuals who go their own ways. The staff has not been stable and the introduction of humanities has severely weakened the position of geography. There have been blockages all along the line for the introduction of CAL geography. The IT advisory service have had a limited computer studies view of IT and this was shared by the Head of the school and by the original teacher (Bruce)

in charge of computers in the school. The other in that position (George) had a vision for IT across the curriculum but was blocked by the Head. Given this range of unfavourable actors and environments, it is remarkable that Anton by 1989 had developed a strong interest in the IT area though one has to wonder given past precedents whether anything will come of it, particularly since the school's very future seems to be in doubt.

School 2B 30/11/83

Background

School 2B is a mixed 11-18 comprehensive school with falling rolls and due for closure in the near future. The site of the school is to form the basis of a tertiary college. The present intake of pupils is not only reduced in number but also in ability. The maths test given to new entrants to the school used to generate several scores in the 90% region but this last year the highest mark was only 68%.

Interviewee

Sam Mars is head of geography and head of resources, on a scale 4, and has been there for two years having previously been at another school in the borough for 7 years. He is relatively aware of developments in IT since has owned his own BBC model 'A' for two and a half years and has made his own games, address book and so on. As early as 1981 he bought the early Computers in the Curriculum Project package of programs as well as WEATHER and CLIMATE both published by Heinemann. He has strong views on the quality of software. Most, apart from CLIMATE, he is critical of. In spite of his early interest in CAL, if faced with a choice between software and books he would at present go for the books. He is aware of programs through the GA Conference and feels many are "hit and miss given the syllabuses we follow." "I suspect that programs will always be a compromise between suitability and commercial viability. Those which I have seen so far do tend to take the form of 'games' even if of a refined form or very specialised topic areas for more advanced pupils." He feels the interactive potential of the 'game' type cannot easily be realised given only one micro per class. Similarly, "those specialised sixth form programs are in many cases excellent but due to the very nature of the examination and quantity of work needed to be covered in lesson time, they will need to form a limited part of the teaching time. In addition their cost in individual units will naturally limit the number and type of purchases possible." He has taken the trouble recently to speak to the Longman 'rep' (on his recent visit to

the school) about software (which perhaps indicates an interest). The dilemma he identifies with software is that teachers are needed to help write the programs but they have insufficient time to do so. "Those examples of computers being brought to life within the classroom, as very useful tools for learning, have been specially written just like worksheets and lesson plans by or with the teaching staff." However he is unwilling to buy software at the moment since is faced in this school by problems of access to micros, though he feels that in the long term that will be less of a constraint than appropriate software.

He has given some thought to this initiative in schools and seems more than willing to air his views. "I am enthusiastic about the use of computers in schools generally and particularly geography." "In the end I hope to see the computer being used in the environment I see as the most valuable. That is with younger pupils in twos and threes and older pupils on their own." He feels strongly that staff need to be able to take home a micro to do their preparation on it. He has a particular view as to how departments can take their CAL geography further. "I would like to see a policy of equipping departmentsany one which has a member of staff interested and capable of using the machine and spreading the gospel....with at least one basic micro for ready use within the subject. I feel at this stage that this is one major step which could begin to introduce the micro into classrooms with software even if unsophisticated but perhaps more importantly it would be geared to the type of pupils and work in hand." "I wonder seriously if a scale 1 teacher in their third year of teaching will find the time to really grasp the essence of computing by hands-on experience without extra inservice training on a large scale being made available." He is very conscious of the day to day pressures on teachers leaving little room for curriculum development initiatives.

When his attitudes to CAL in geography were explored a certain ambivalence was identified. On the one hand he is both positive and reasonably well informed. For instance he agreed strongly with statements e, l, m, and o. (see Fig.) which suggests a positive stance and he disagreed with statements f, g,

and h which suggests an informed stance. Yet on the other hand, he either agreed or strongly agreed that 'there are too many problems involved in using computers in geography teaching (statement a), 'until more micros are available to teachers, there is little point in using CAL in geography classrooms' (b) and 'geography programs are of low quality.'(c) What is clear is his willingness and interest in airing/sharing his views on CAL in geography even though many of these tend to be on the negative/pessimistic side. He did seem to have a rather optimistic view of the possibility of producing one's own software. "Having a BBC computer myself I shall be able slowly, time allowing, to produce a few tailored pieces of software myself."

Geography Department

Geography is strong and popular in this school. There are five fulltime staff teaching the subject, one of whom is half time and 95% of the third year pupils opt for geography at 14-16 level. However along with the rest of the school they are a part of a collegiate system which means they have the sharing of sixth formers in theory but this means in practice that they get very few sixth form geographers. Because of imminent school closure the geography department has put a block on further curriculum development within the subject. As mentioned earlier, there are a few programs for geography but the impression given is that they are not used. There is no awareness of CAL in geography apart from Sam the head of department who does not seem to have made efforts to interest or train any of his department in this respect. The constraints at work on CAL geography are mainly seen to be "insufficient time and budget." The departmental allowance is £2000 per year which works out at £1-20P per pupil in geography and this figure has to include stationery.

The School

It seems that the Head according to the lady teacher who teaches most 'computer related' lessons, "makes a big deal about expanding the computer studies department in the school but he is only interested in hardware.....software..it's a joke...we don't have any." She feels there is no great commitment in the school to

CAL across the curriculum. The room housing a variety of micros (2 380Z's; 2 Spectrums; 3 ZX81's; with 5 BBC's ordered for the spring term) is used all week, apart from one period, for fourth and fifth year computer studies ('O' level and CSE) or for computer awareness lessons for the first three years in the school. Therefore "access to micros is a nightmare", she says for those who wish to incorporate CAL in their subject areas.

The school, unusually for this (or any other LEA) had an early terminal to the local poly mainframe and early on the head of physics was given the added responsibility of being in charge of computers. He, like the Head, does not have a vision of IT across the curriculum.

Because of imminent closure, redeployment looms large for many of the staff. Sam for instance is depressed by the existence of 'ring fencing' around LEA's and thus accepts that his future will have to be within LEA 2. Unofficially he has been told by a senior education officer that by 1987/8 there will have been a 25% reduction in the teaching staff of the borough. Even though this school site will start, in part, to be a tertiary college from September 1984, many of the staff are repressing that fact and its likely implications for themselves.

The LEA

The LEA impinges very little on the work of this geography department. "We haven't got a geography adviser...we have an adviser with a higher job." The group of geography teachers who meet together and are coordinated by Deryn Hartford relies on voluntary labour and people are now saying, 'Sorry, we can't, won't go there.' (to meetings arranged) According to Sam it is seen by some geographers in the borough 'as a means of stepping up the ladder' but "the whole thing is now actually falling apart" since it relies so much on voluntary labour. He feels that Deryn was advised to do the coordination of the group as a means of gaining promotion and has subsequently done a great deal of good work. He feels that she has been inadequately rewarded.. "to be quite honest I feel she has been badly treated." No mention of the policy of the LEA or the impact of the adviser with

responsibility for computing (Sidney Boyce) was mentioned in my conversations with Sam and this suggests minimal impact since Sam is aware of many other borough-wide developments. Indeed what he did say was rather negative about LEA organised INSET courses. "You're going to get a hellishly biased comment now....generally speaking courses provided at the Teachers Centre are a load of old....." He is scathing about the short INSET courses provided. He feels "you need to be out for a minimum of a term to achieve any real good." Particularly, he feels short courses become "a talking shop." He has attended a one day course on computing at the local poly which I presume is at least part basis for such comments.

National Picture

Apart from attendances at GA Conferences (by Sam) there was no evidence in this school or department of a wider perspective and awareness. Thus MEP, books, journals, conferences and so on seem to have passed them by.

School 2B 1/2/85

The tenor and to an extent content of this interview was influenced by the imminent closure of the school and the opening of the tertiary college. The previous Head has now left and the deputy head has now taken over until closure. By June 1987 all staff will have had to have moved and therefore many more of them are now having to face that reality. Indeed all staff are having to have interviews with advisers about their future. Staff anxiety has increased considerably and many don't see a job ahead at all never mind a career. "Most people are tired all the time now," remarked Sam. Of a staff of 65, 25 are now on short term contracts. Many of the latter have been taken advantage of according to Sam. An LEA/school ploy has been to encourage and fund secondments to help staff gain new skills and become more employable. There were eight such secondments in 84/85. (Sam benefited from one

later in the year 1985/6) The school has continued to lose pupil numbers and the intake this year is only 50/60 compared to 180 originally. A "good number of first years come from ethnic backgrounds with limited skills in English."

Sam's interview with Gail his adviser suggested "There was no way forward for people like myself in schools....and I've got to think about something else to fit in and computing was suggested." Interestingly a computer arrived two weeks or so after that interview, essentially paid for by Gail's money and with the full blessing of the acting Head. This he is now keeping at home. No software has been provided with this micro but Sam is hoping to get some (not geographical by the sound of it) from the TVEI/computing adviser with whom he has had some contact. That is the only contact with an adviser about computing he has had and then it has only been limited.

Apparently a recent HMI visitation to the LEA criticised the the keeping of TVEI resources in the Teachers Centre which was seen as being inaccessible for schools, and the point was made particularly about software kept at the Centre. Sam continued in this interview with his criticism of available software but one wondered how knowledgeable he actually was about the software now available. He felt that some software was "geared more to adults than to children." To make this point he used the example of SLICK. "The best ones I've seen have been written by teachers...it seems the vast majority are written by people who aren't aware of how you've got to present things. They're better further up"(GCSE upwards) Again however he is weak on the details of programs and does tend to talk in generalities. He also repeated his view that "You've got the problem of one computer and 30 children." However he had helped to set up a viewing of software at the local poly but felt that the one evening was not what was needed by the geography group since the lecturer at the poly seemed too keen on "exploring the workings of the software."

He was just as depressed as before about the workings of the geography group. "That in itself is dying because it is only those with a strong interest who attend."

(and that is clearly only a small group) The coordinator of that group, Deryn Hartford, had an increasing role in TVEI within the LEA and so was able to spend less time on geography group business. She has become one of the LEA coordinators for TVEI. On the other hand Sam reckons that has brought more geography software into the Teachers Centre using TVEI money but he is not aware what it consists of or indeed used it. It has become a high priority in the borough. "The people who matter..high up, are very keen to see it grow." There are now 9 schools in the LEA which are now TVEI schools which suggests the truth of this. Within the school the pressure on micro facilities has been maintained not least because the LEA put out a directive that each school should provide some sort of awareness course for pupils in each of the first three years in the school and that thereby confirmed the provision that the school had already made for that. Although there is now a TVEI lab it is used fully by both TVEI and home economics and access to micros for other departments has not improved. He does seem to be particularly hard-pressed. "Just being head of geography and in charge of resources in this school is enough." Frank the head of physics and computers seems equally stretched. "Poor Frank can just about manage to get through the day." In spite of that pressure he did last year run six or seven evenings after school for all subject teachers to look at the possibilities of using micros but those who became interested found the difficulties of access to micros very frustrating.

The new (acting) Head is very keen to realise the potential of computers in the school, not least because her son has just graduated in computer studies, but she lacks resources to make such progress.

The final view ("It's a terrible thing to say") expressed by Sam is that he feels younger teachers (as he did in his day) are not taking on the curriculum initiatives and that burden has stayed with the older group such as himself.

School 2B 31/7/90

In this conversation, Sam explained that Gail Joplin the senior adviser with responsibility for geography had left in 1986 to take up a position at an Institute of Education. Before leaving she had advised him not to stay in LEA 2 to undertake the fulltime Diploma in Educational Computing. This he successfully achieved by July 1986 and a part of his work was 'A study of the computing initiative within secondary education and the teaching of humanities.' This research involved a series of case studies; three of London LEA's; one of 'the Scottish experience'; and six of schools in LEA 2. Each studied their specific approaches to educational computing. His policy recommendations are shown on p.220/1. In particular he saw an increased and changed role for the LEA in stimulating and supporting IT across the curriculum in its constituent schools. These recommendations and the case studies point out, in a subtle fashion, (since the report was intended for the advisers in the LEA, his 'masters' for all intents and purposes and the cause of many weaknesses identified) a range of crucial weaknesses in the LEA's policy to IT across the curriculum. Sam, on reviewing whether any of the recommendations had been taken up by 1990, commented that only recommendation 8 whereby a science group had been set up, and recommendation 10, in the form of INSET support for network managers, had been implemented. I was his tutor throughout this year.

On the appointment of Paul Edwards as advisory teacher (AT), then adviser for educational computing. Sam felt he "had spoken the right jargon" (in the sense that he was very much a computer studies person) and had "fitted in" in a variety of ways. He had run various INSET courses with Marlene Southern and this, he implies, helped her cause when she went for the AT position which Paul had just vacated. Sam felt that Paul was "not very bright" and lacked 'vision' for IT across the curriculum. His major impact had been in the area of hardware guidance where the commitment to Nimbus micros became increasingly obvious. His major priority was to persuade Heads to purchase more micros and in particular Nimbus'. He ran

courses for Heads and for IT coordinators. The courses for the latter were geared especially for network managers who were seen as 'key actors' in the borough and seen as potential 'trainers' within their own schools. These short courses were very much technologically oriented. The other courses organised by Paul and Marlene were seen by Sam as being insufficiently practical, even to the course run on the INSET pack by Marlene. Several packs, to Sam's knowledge, are now gathering dust in several schools in spite of that course.

Dan Godber on the other hand had increasing power and was particularly interested in the processes of learning. An especially influential policy of his was the curriculum initiatives committee which was seen by some as a vehicle and nursery for promotion. In addition it helped to formulate policy for the LEA. Dan became Chief Adviser and so was in a powerful enough position to carry through such policy suggestions.

Kay Morris who took over the position of adviser for the humanities from Gail Joplin in 1986 had had problems getting the support and confidence of heads of geography because there had been several years beforehand of efforts, not least by Dan Godber and his curriculum initiatives group, to bring integrated humanities into the schools curricula. This had met with resistance and led to resentment. Only a handful of schools had gone over to humanities courses from 11-16 level in spite of such pressure. This suspicion, with which she was faced, made Kay's job very difficult in the recent past when she has been trying to get heads of geography to work together on the national curriculum for geography. Attendance at geography teachers meetings had also declined since an unfortunate meeting held in 1988 at which a well known university school of education tutor spoke on the national curriculum and there was an unfortunate and acrimonious discussion between him and one of the senior advisers in LEA 2. Teachers were apparently disillusioned at her inept contribution to the meeting.

His final comments were directed at criticism of the advisers as a body. He felt they were too geared to 'process' in their thinking and made some disparaging

remarks about them being 'refugees' from ILEA. He sees the 'jewels' in this LEA's crown as being profiling, records of achievement, and appraisal at the expense, he implies, of the main subjects such as geography. He sees Dan Godber as a key actor in bringing that about. Finally, because LEA 2 is a marginal Tory seat and its MP has just been given a ministerial position to do with education, from now on, he reckons, it will increasingly be in the political spotlight as far as its education is concerned.

Post Script

The context of these interviews, that is a school with falling rolls, declining numbers of tenured staff and imminent closure obviously has to be borne in mind here. Sam is an interesting character who has an interest in IT and displays some 'vision' but his views seem little changed over the years and one wonders as to how informed he actually is and the extent to which he is aware of wider trends. This could be said of many other educators within this borough since outside links and influences on them seem minimal. In spite of an underlying interest in CAL the overriding impression in my interviews is of pessimism and an acceptance of being 'trapped' in that LEA. This feeling must have been reinforced by the contrast between this school (2B) which is trapped in a downward spiral and his previous school in the borough which was popular and over-subscribed. Like so many in the system he has been given so many responsibilities that he has little time but to survive let alone innovate. Support for CAL geography was absent both from within that school and from within the LEA. Having returned from his secondment, the LEA failed to make use of his newly gained expertise in IT.

School 2C 22/2/84

Background

School 2C is an 11-18 comprehensive on a split site, the lower school for years 1-3 and the upper school for the remainder. The present lower school was the site for a secondary modern and the upper school was on the site of a grammar school.

Seven years ago they merged and the Head of the grammar school became the Head of the new creation. I was told the school since then has had a good reputation "partly because of exam results and partly because of a recognisable uniform which is very strictly adhered to." The school is oversubscribed, has an 8-form entry and has an ability range near the normal curve and without the 'tail' of less able pupils which schools to the East of the borough, such as 2B, have. It draws its pupils primarily from the more affluent and middle-class west of the borough.

Interviewee

Cheryl Dean is the head of department and has been at the school since Easter, 1983. She has spent three years teaching geography in a school in north London, then three years in a field study centre in the Midlands and then taught in a school in west London where she was head of a small geography department. She seems interested in CAL geography and has a number of good intentions. For instance, she wishes to purchase software to support the GYSL course which will be taken by all 14-16 year olds next year. "Next year I will be ordering some.....so in a sense I am holding back." The department has the 1979 Longman (originally Arnold) suite of programs but she is not keen on them. She has seen other software at the Advisory Unit for Computer Based Education (AUCBE) with which she is much happier. She went on a day's course to AUCBE when she worked in west London and "I thought it was a very useful day.....if we can get some decent programs in....I would like to bring the computer down into the classroom....like to show geography students that you can have a computer in your classroom." Her major worry at

present is the quality of the software and as yet its appropriateness.. "Some of the games/location type ones require an awful lot of knowledge to use them properly....it is difficult to persuade kids it isn't just a computer game." She sees potential for CAL in the summarising of information and mapwork. Her attitudes are generally positive to CAL geography and she seems anxious to impress that upon me. However, her knowledge seems patchy. For instance she agrees that ' CAL can help to motivate pupils in geography lessons' and 'CAL can help children handle a range of variables in a problem solving situation', but on the other hand she agrees that 'The main value of microcomputers is to perform statistical analysis of geographical data' and 'for the storage of geographical information for retrieval.' (a clearly limited perspective on the potential of CAL)

She seems fully aware of the computer initiatives being taken by the school especially since the arrival of Mr Denton as head of computers and of the interests of her staff in this innovation. She is aware in detail of the respective roles and responsibilities of each member of her department.

Geography Department

There are six full time geography staff. The previous head of department is one of them but is now senior master and head of third year. There are a considerable number of scale posts within the department, each for specific responsibilities. For instance, Peter Essex is in charge of a geology 'O' level group. Geography is a compulsory subject until the fourth year, where it is a popular option with over half the year group opting for it. Both coursework and fieldwork are integrated into the geography curriculum in the years up to 16 and that could indicate a relatively 'progressive' approach. At the time of this interview there were 19 'A' level students taking geography across the two years of the sixth form. The status of geography is high within the school. "...very good standing in the school for a number of reasons. We have a very good staff....I am very lucky.....everyone in the staff is enthusiastic, experienced and competent. Also we get very good exam results and we are held in high esteem by the head in that respect.....school sees us as a competent,

forward looking department.” They have a highly organised range of resources in the department and their ‘box’ system of filing has been adopted by various other departments. As a department they have not been affected by the ‘drift’ towards science.

There is some experience and interest within the department for CAL. For instance, “Mr Essex has used the Longman programs and he has talked quite a lot with Mr Denton.....he’s quite interested in using computers but he thinks the Longman set is rather limited.” Another member of the department has been on a weekend course at Hatfield. “She’s quite keen I think.....if we can get some decent programs in.” Software is seen as the biggest single constraint. No details of specific use of software was made. If anyone it has probably been Mr Essex who has used CAL.(but no details were provided) No indication of a particular management strategy used by Cheryl Dean was given.

The School

In the last year there have been a number of developments. There has been a great deal of successful fundraising by the PTA and this has, along with money from the MSC, led to two computer rooms being established, one in the upper school and one in the lower school.(all BBC’s) In addition there is another 380Z which is used for administration. Mr Denton has also been appointed as head of computers on a scale 3. He was a mathematician and “He ran some evening sessions to show how to set up a micro, switch it on etc.....which a lot of us went to.” There are now computer studies groups at the 14-16 level and all lower school pupils have a computers lesson (apparently computer awareness) each year. The Head seems keen on these developments. “The Head has made comment in meetings that all children are being given a chance to use the computers.”

No clear school policy about computers came through from this interview.

The LEA

Cheryl, straight away mentioned the occurrence of LEA geography teachers meetings twice a term and the occasional heads of department meetings, but in the

same breath remarked, "I haven't had any contact with the advisers yet.....there's no geography adviser and I feel that is a great lack, problem." The impression given is of very limited contact with teachers or advisers beyond the confines of this school. Given the staffing strength of geography in this school they possibly don't miss such contacts as much as weaker, less self-contained departments. No feeling was given in this interview of any LEA policy having an impact.

National Picture

Wider influences of the GA or the 'world' of educational computing did not seem to impact on this department.

School 2C 1/3/84

One of my student teachers in 1983/4 (Don Lowis), undertook TP at this school so I interviewed him to get another perspective on the work of the department.

Apart from the former head of department, three members of the department had been at the school for three years and had all applied for the head of department position. This, according to Don has created tensions. "This has created a certain degree of conflictthey feel she lacks vitality and interest. They don't think she's up to date." They don't think she is better qualified than themselves and reckon she was appointed for her fieldwork experience but they feel the fieldwork they undertake is 'better'. "An atmosphere of conflict does exist but rarely comes to the surface." Don feels that "contact between teachers is less" because of the split site nature of the school. He reinforces Cheryl's comments on the strength of geography in the school. "It stands very highly.....because I think teachers in the department are all very good....other teachers are not so motivated or have such ability....students prefer geography and geography teachers." He also pointed out the good resources for the teaching of geography such as the recently acquired slide projector and blinds in the geography rooms in the upper school. He feels the environment for curriculum development is favourable since the teachers are motivated and there is no shortage of finance because of the subject's reputation

with the Head and the successful fund-raising efforts of the parents. On the other hand, Cheryl without consultation, has purchased a full set of (GYSL) 'Core Geography' books which he argues could block change. Also he feels another key blockage to curriculum development are the unhappy personal relationships within the department and that "she is not a person who is very dynamic or interested in change.....they don't respect her qualities as a teacher or as an innovator or as a head of department....." This has not been helped, he argues, by Cheryl taking "unilateral action in all sorts of little ways.....She must be aware of it." This perhaps explains an unfortunate incident concerning Don's TP. I had spoken to Peter Essex and another member of the department about the possibility of Don teaching some sixth form geography. This conversation Cheryl had strongly objected to and felt I had gone behind her back and her reactions were emotive, and written down at length to me in letter form. The two staff to whom I had spoken, "thought it was fairly ridiculous...a storm in a teacup."

According to Don, Cheryl is unaware of the range of possible changes to the geography curriculum. "I would suggest that she is unaware at the moment of a lot of changes.....she needs to be shown there are alternatives.....(her) teaching style is to stand at the front and answer the questions from the textbook...a shame....waste because she does get on with the kids, very, very well." He claims that "managing teachers doesn't seem to be one of her strengths."

Don also remarked that, "As far as I can see the department has none at all."

(outside links)

As to CAL in geography, a problem seems to be the difficulty of booking either of the much used computer rooms. The Longman pack of materials has not been used for a long time and "Cheryl did not know it existed." Don doesn't see any likely progress in CAL geography in the near future since the momentum of the purchase of the early Longman pack seems to have been lost with the promotion of the former head of department who bought it.

School 2C 1/2/85

This interview is with the newly appointed head of geography, Peter Essex, since after just one year at the school Cheryl has been promoted to a year head position. He is delighted with this promotion.... "very much so", since he had begun to look elsewhere the previous year to try and move his career along. He explains that this school is one of the fortunate 'western' schools in the borough which are oversubscribed and middle class with healthy sixth forms. "There are lots of sink schools" (in the Eastern part of the borough) he remarks, to be served by the soon to be opened tertiary college on the site of school 2A.

There have been no staff changes since last year apart from promotions. Now there are two scale threes, one scale two and a senior master in the department.

"Because they have high levels of responsibility in other areas it means that the sort of impact you would expect from a full-time geography teacher is going to be less....I just accept the fact and am really quite glad....the classroom practice will be done very, very well...it relieves me of that responsibility." Curriculum development in the department then is down to Peter and his colleague Joan who are the only two full-time (in the sense of not having any other major responsibilities) geography teachers. A geography HMI visited the school in the summer term of 1984 and "was impressed and very helpful as well." the most glaring criticism was the physical condition of the building. "He was impressed by the team of people...obviously well organised." Based on his advice they are moving towards a new 11-14 course followed eventually by the 16-19 Project A level. The decisions about these and other curriculum matters is now made by Peter and Joan. As a department they offer an unusual range of courses including an established 16 plus in geology and a newly set up course at 16 plus on meteorology and oceanography.

I then went on to ask him about CALin geography. From now on he waxed lyrical about this innovation in a way quite unlike the interview last year with Cheryl. In the past it seems that Peter has been the only member of the department to have

implemented this innovation. The school now acts as a centre for City and Guilds computing and now has a third network of computers paid for by TVEI. "After we have met tonight I am meeting the head of computer studies who is keen to get CAL across the curriculum....the CAL learning is something we actively advertise on parents evenings.....he (Mr Denton) is promoting an IT across the curriculum policy.....he made a point of making sure that geography, biology, chemistry all had machines set up in their departmental rooms with subject software running on them which are things we are bringing in now." "I bought a set of the NELCAL mapwork programsspace is being found in computer studies lessons to run these geography programs." He seems to be spending a good deal of time discussing the possibilities of CAL in geography with Mr Denton. "The thing he is talking to me about is the new BBC packages...Radiovision cum computer software....what we are negotiating tonight is to have a week of timetabling...to make it a cross curriculum thing (maths, geography, history and probably biology are all involved)...we are hoping to freeze the subject timetable in the summer term in the lower school...come together with a week's teaching around this package." "There are certain heads of department who are keen to get it in.....problem though...most of the software is irrelevant and a lot of it is rubbish...so the actual scope I've got to buy from is very limited, but again it will come....it's growing all the time so that's likely to solve itself for the main subject areas." He has discovered that often small technical problems have been a constraint. "The first year mapwork package that we got is ideal in that there were some nice stimulating ideas in it.....the problem was that because of security you can't run the disc on a network system.....those are the things that have physically stopped us getting more kids using the disc...these nagging little technical problems more than anything."

I asked him about courses attended. He has been on a one day course at the local RIC. "There have been courses at the Teachers Centre as well....I didn't bother going because they were how to plug the machine in (run by local polytechnic with a computer studies emphasis).....I also went to (another local poly) for a week's

course on 'Geography in the '80's'....it was very good.....they had a day on computing. The only software they had at this time was the 1979 pack of programs and a Weather program. Peter was the only member of the department who had 'had a go'. The constraints which had prevented any 'action' since last year were the small technical problems mentioned earlier, the difficulty of booking much used computer rooms, and the lack of suitable software not least for GYSL. "...but now there is a series....I've just read today...NELCAL....Tourism etc. which I will buy." The Head is willing to support such initiatives. "Any learning initiatives like that which will improve the quality of learning, teaching methods used....he has always supported....no problems at all."

I then asked about support from the LEA to do with CAL. "As far as I know virtually no input from the borough." As to support for geography teachers; "With no geography adviser we've got nothing.....there's no coordinated geography policy at all. Unless there is somebody willing to take on that huge workload (from Deryn Hartford) the geography teachers group will die a death....it (the group) in effect takes over the advisers job....it's only the keen few who turn up because it doesn't have the 'clout' of an adviser.....there's no geography INSET...that's the big problem. To me that's the biggest problem in the borough, this lack of geography guidance.....most other subjects are covered by advisers. As far as she can she's (Gail Joplin) very supportive but obviously a non specialist can only do so much." Consequently he has few links with other geography teachers in the borough. "I don't really feel the need....I must admit that we can be (autonomous). There must be 5/6 heads of department in the borough who I have never, ever seen in six years." The teachers he knows are very much the GYSL consortium teachers. The isolation of geography teachers in this borough is illustrated by Peter's amazement that a particular school in the borough had decided to take on the 16-19 Project. He had no idea that that was the case and was pleased to know since wishes to set up a 16-19 group in the borough.

I asked him about the department's unhappiness last year with the newly appointed

head of department (Cheryl Dean). "I don't think it would have mattered who came in ...it would have been difficult for anybody to have imposed any other line." We had "a core of good committed people over 4 years or so....and things had really gone on (under the previous head of department now a senior master)...a high degree of devolved power to people....I think the best way to run a department."

4/7/89 Questionnaire Return

Since 1985 Joan is now head of department. The major departmental changes since then have been the introduction of profiling, GCSE (they have gone for the GYSL syllabus) and the Geography 16-19 A level. Staffing is the same. The subject has retained its popularity and if anything numbers have increased. The department now has a computer with a printer and EDWORD a word processing package (the implication being that it is used only for departmental administration.). The lower school computer room is used by geography two to three times a year for the MAPSKILLS program in the first years and for NOMAD in the second year. With the lower sixth they use STATUS (a data handling package) and RIVER, both produced by ITV. She sees group work, the reinforcement of skills and ideas and data handling as the 'opportunities for the use of computers in geography.' The constraints she identifies in the use of CAL in geography were, not enough computers and too much preparation beforehand.... "eg. formatting discs, copying programs, briefing students." She feels a technician would help.

INSET attended included one half of a 'Baker' day and the five sessions after school organised by the LEA to introduce 'the Learning Geography with Computers' pack which they now have. Her concluding comments were, "Desire to use computers is there....some expertise is there...time and equipment to put it into practice is difficult/ not there."

Post Script

This department is a strong and successful one. Throughout the interviews there were good intentions to engage in CAL geography but they never fully materialised.

Several staff have attended courses on CAL geography over the years. Staff continuity has been there but not continuity of the position of head of department. Particular difficulties were experienced by Cheryl in her dealings with other more established members of the department. So at that time initiatives must have been difficult to set up. They constantly bemoan the lack of support from the LEA for geographers but seem able to be an autonomous unit. One wonders if curriculum development is not held up by the majority of the department having major additional posts of responsibility outside of geography and therefore are unable to concentrate all their energies on the geography curriculum. The beginnings of real 'action' was noticed in 1985 when Mr Denton and Peter Essex were working a lot together with a joint commitment to bring about CAL across the curriculum. Peter seems to have been the one geography teacher over the years to have engaged in any amount of CAL and with any real commitment to it. However with Peter being moved to an administrative position out of geography that momentum and interest and expertise has been lost. By 1989 the 'action' is still awaited!

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